



1998 SEMINAR TOUR

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2/12 New York, NY
3/3 Dallas, TX
3/4 Chicago, IL
3/17 Washington, DC
3/19 Atlanta, GA
4/8 Newport Beach, CA
4/9 San Francisco, CA

Presented by
Cathy Gadecki,
TeleChoice, Inc.

SEMINAR OVERVIEW

As a network IS professional, your end-users are continuously finding new ways to leverage your network for business advantage. The resultant traffic load is rapidly pushing LAN and WAN backbones to the breaking point. At the same time you are struggling to support the high QoS demanded by new applications such as web browsing, desktop conferencing and collaborative groupware.

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ATM Integration: Discovering How ATM Fits In Your Network is designed to help you discover ATM's fit into your local and wide area network architecture. *ATM Integration* explores the capabilities and benefits of ATM and carefully examines its interoperability with multiple current environments including ethernet, token ring, FDDI, frame relay, voice and IP.

The seminar is taught by leading ATM expert Cathy Gadecki of TeleChoice, Inc. Cathy is co-author of the popular *ATM For Dummies*® from IDG Books Worldwide with over 10,000 copies sold in its first six months. You will learn more about ATM, its uses, alternatives and criteria for evaluating ATM vendors. You will leave the seminar with the information needed to help you decide whether to and how to implement ATM in your own enterprise network.

NetworkWorld

TECHNICAL SEMINARS

ATM INTEGRATION

Discovering How ATM Fits In Your Network

THE TOP 10 THINGS YOU WILL LEARN AT THIS SEMINAR . . .

1. Understand how ATM can interoperate with various existing networks, including ethernet, token ring, FDDI, frame relay, voice and IP.
2. Learn how other users have implemented ATM, and how they justified the change.
3. Obtain a list of questions and checkpoints for evaluating ATM vendors.
4. Find out how you can use ATM as the backbone for your existing ethernet and token ring LANs and increase server throughput.
5. Explore how you can use ATM in your WAN to unplug your frame relay bottlenecks and increase Internet connection speeds.
6. Uncover the facts on using ATM to carry voice traffic.
7. Investigate practical strategies for transitioning your current network to a LAN or WAN ATM backbone.
8. Compare and contrast ATM to other solutions for the campus and wide area networks.
9. Learn three ways to send IP traffic over an ATM network.
10. Find out what you can expect from future ATM equipment and services.

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TURN TO INSIDE BACK COVER

1. Introduction

In the fast changing networking world it's hard to keep up with which technology fits where and why. This section talks about ATM basics — its advantages and disadvantages — as well as common applications of the technology.

- Communication Drivers
- Common Applications
- ATM's Advantages
 - Scalability
 - Multiple Service Qualities
 - Multiple Networks
 - Cost
- ATM's Drawbacks
 - Complexity
 - Conversion
 - Cost
 - Competition

2. Getting Past ATM's Jargon

ATM has a lingo all of its own that sometimes can sound like a foreign language. In this section you'll get an overview of how ATM technology works inside the network and get an explanation of all that ATM techno-babble.

- Where Does the Jargon Come From?
- Layers and Layers of Protocols
- Physical Interfaces
- Adaptation of Traffic
- Cells
- Logical Connections
- Service Categories
- Traffic Management
- Signaling
- Connecting ATM Networks

3. ATM's Interoperability — Adding ATM into the Existing Network

ATM vendors have put forth much effort on defining standards and developing capabilities to integrate ATM into your existing LAN and WAN. The result is that ATM can interoperate with many existing protocols and support many different network configurations and applications. Learn what these solutions can really deliver, when you should choose one over another and what their true availability and maturity are.

- Circuit Emulation for the WAN
- Frame Relay Interworking for the WAN
- RFC 1483 for IP
- RFC 1577 for IP
- LANE for Ethernet and Token Ring
- MPOA for Multiprotocols
- RSVP for IP
- Video

4. ATM in the Campus

Users have implemented ATM in many different parts of their local and campus networks using a variety of different configurations. Find out where you might use ATM in and between your buildings, what other alternatives you have and how you can get from here to there. You'll learn about the different options for evolving your network and configurations to integrate ATM with other key technologies, including ethernet, fast and gigabit ethernet, token ring and FDDI.

- Where Can You Implement ATM?
 - High Speed Desktops
 - Congested Data Backbone
 - Congested Server Connection
 - Consolidated Enterprise Network
- Comparing ATM and the Alternatives
 - Switched Ethernet
 - Fast Ethernet
 - Gigabit Ethernet
 - IP Switching
- Migration Strategies
 - Workgroups
 - Virtual Workgroups
 - LAN Backbone
 - Enterprise Backbone

Case Study — Network managers are struggling to scale campus backbones to keep pace with the rapidly growing traffic load. This case study explores one company's introduction of an ATM backbone to deliver higher performance to end users.

5. ATM in the WAN

The WAN has been the traditional bottleneck in the network. ATM can open up the bottleneck for sites requiring T1 and greater bandwidths. Find out where you might use ATM in your WAN, what other options you have and how you can get from here to there.

- Where Can You Implement ATM?
 - Congested Data Backbone
 - Bandwidth Hungry Application
 - Consolidated Enterprise Network
- Comparing ATM and the Alternatives
 - Private Lines
 - Frame Relay
 - Native IP
 - IP Switching
 - Native LAN
- Private Versus Public Solutions
- Migration Strategies
 - Private TDM to Private ATM
 - Frame Relay Service to ATM Service
 - Private ATM to Public ATM

Case Study — The largest WAN users are finding that their T1 frame relay connections are no longer sufficient at their backbone sites. This case study explores the transition from frame relay service to NxT1 and T3 ATM service at core backbone locations to support higher speed LAN-to-LAN connections.

6. ATM and Voice

Although ATM was fundamentally designed to carry voice traffic, very few ATM implementations currently transport voice. This section explores the available solutions to move voice over ATM as well as the current challenges and limitations.

- Circuit Emulation
- Packetized Voice
- Architecture Considerations
 - Interoperability to the PBX and PSTN
 - Echo Cancellation
 - Signaled Connections
- Comparing ATM and the Alternatives
 - Voice on Frame Relay
 - Voice on IP

Case Study — Transporting voice over an existing ATM network can be very inexpensive — less than a penny a minute in incremental costs. This case study investigates the economics of carrying private voice over an ATM infrastructure as opposed to a public VPN for a variety of network configurations.

7. Evaluating ATM Equipment and Service

If you're ready to invest in ATM you'll want to know the tough questions to ask potential vendors. This section provides considerations and insights to guide your purchase decision.

- ATM Equipment
 - Architecture
 - Features
 - Performance
 - Availability
 - Interoperability
 - Network Management
 - Overall Costs
- ATM Services
 - Packaging and Features
 - Performance
 - Availability
 - Interworking and Interoperability
 - Network Management
 - Pricing

Register and You Will Receive ...

- Comprehensive Seminar Workbook
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1998 ATM Seminar Dates & Locations

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About the Seminar Presenter ...

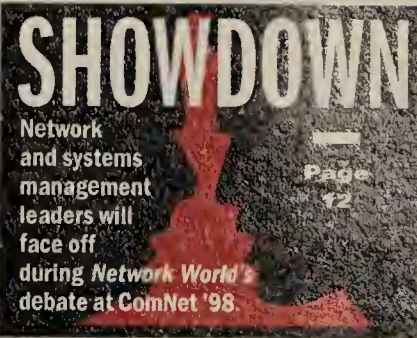
Cathy Gadecki is a recognized expert in both the broadband and internet services arenas. As a Senior Broadband Consultant with TeleChoice, Inc., one of the world's foremost authorities on telecommunications issues, she works with end users, equipment vendors and service providers on ATM implementations.

Cathy has participated in the hectic, challenging and unpredictable development of ATM technology and services for seven years. Prior to joining TeleChoice, Cathy held positions in product management and strategic planning at a large IXC. This experience included three years working closely with end users as they evaluated and implemented ATM networks.

Cathy recently co-authored *ATM for Dummies*® with Christine Heckart, a useful and easy-to-understand guide for ATM LANs and WANs. Over 10,000 readers have found *ATM for Dummies*® to be a practical guide in ATM networking, giving guidance on where to start, what to worry about and how to succeed. Cathy is frequently quoted in local and national publications, has published several articles on ATM and has been a speaker at ATM events worldwide.

NetworkWorld

THE NEWSWEEK OF ENTERPRISE NETWORK COMPUTING



Trouble in the skies?

By Charles Bruno

Motorola's Iridium satellites rocket toward the heavens.

A pack of providers is wagering upwards of \$50 billion on emerging voice and data satellite services, but who's buying?



VANDENBERG AIR FORCE BASE, CALIF.

It's a chilly dusk in November at Vandenberg Air Force Base, the last remnants of a spectacular sunset slowly fading from orange to night. Suddenly, a blaring horn breaks the picturesque silence, warning base personnel of the launch of a Delta II rocket five miles away. A crowd milling about breaks into anticipative chatter.

On this night, a white Boeing Co. Delta rocket will ferry five Motorola, Inc. Iridium satellites into a low-earth orbit (LEO), joining 34 others at the core of a space-based telecommunications infrastructure that promises to bring new voice and data services to users worldwide.

See page 39

3Com switches will run cheap

By Tim Greene and Jim Duffy
Washington, D.C.

3Com Corp. will use the ComNet '98 show here next week to wheel out high-speed hubs and switches that offer some of the industry's lowest prices per port.

3Com will not have the lead for long on the hub side, though. Bay Networks, Inc. soon will announce new products with bargain basement prices (see story, page 56).

At ComNet, 3Com is expected to announce a higher density version of the company's Gigabit Ethernet switch, the SuperStack II Switch 9000 SX. The new product, called the SuperStack II Switch 9300, has 12 ports vs. the 9000's eight.

The 9300 is a wiring closet device designed to aggregate traffic from existing Fast Ethernet and Ethernet workgroups and server farms equipped with Gigabit Ethernet uplinks. In a typical network configuration, the 9300 would be used to connect these

workgroups to a 3Com Core-Builder 9000 Layer 3 Gigabit Ethernet switch in a center.

The 9300 is part of a product rollout that will see 3Com drop the price of a Gigabit Ethernet port to \$1,249 — half the port price of the

SuperStack II Switch 9000. Prices for 10/100 autosensing ports will drop to \$175 per port, just slightly above Cisco Systems, Inc.'s \$167 per-port pricing for the recently announced 24-port 2924 XL switch (NW, Jan. 12, page 14).

The pricing is "pretty amazing,"
See 3Com, page 56



Acquisition Action

Page 8

- Cabletron snatches switching router vendor YAGO Systems.
- Bay Networks makes secure remote access start-up New Oak its newest purchase.
- Inside New Oak: How to make \$156 million in 17 months.



New Oak founder Tom Pincince

AT&T seeks partners

By David Rohde

Washington, D.C.

The "not invented here" syndrome is dead at AT&T.

Fresh with marching orders from new Chairman and CEO C. Michael Armstrong, AT&T executives are racing to line up a

smorgasbord of new partnerships to deliver everything from managed WAN services to residential cable telephony.

The first of these may be unveiled as soon as next week at ComNet '98 or when Armstrong meets with analysts in New York.

"They're aggressively talking to companies like Sun, Digital, IBM, and Microsoft about deals," said
See AT&T, page 55

AOL to go corporate with VPN service

By Denise Pappalardo
Vienna, Va.

America Online, Inc. is preparing for a major push into the business market next month when it will introduce a secure virtual private network (VPN) service.

But the online service provider

may find its potential business customers are still haunted by horror stories of AOL's network troubles of a year ago.

To reassure edgy customers, AOL is striking deals with security and software vendors whose technology should help make

sure the VPN service is up to snuff. The new service will share the name AOL Enterprise with the company's current business service.

Today, AOL Enterprise essentially is a privatized form of AOL's popular consumer online service. But the VPN service will let
See AOL, page 55

MORE ONLINE:

- A look at VPN offerings from other companies
- A VPN audio primer
- An overview of AOL's network problems a year ago

5 4 2 1

Novell preps BorderManager for a face-lift

By Christine Burns

San Jose, Calif.

Novell, Inc. is readying a new version of its BorderManager Internet access suite that is more versatile and easier to administer.

BorderManager, which consists of caching, virtual private network (VPN) and firewall software, has been Novell's fastest-growing product line since it began shipping last fall. Customers can expect to see the new version ship before NetWare 5.0 does this

See Novell, page 56

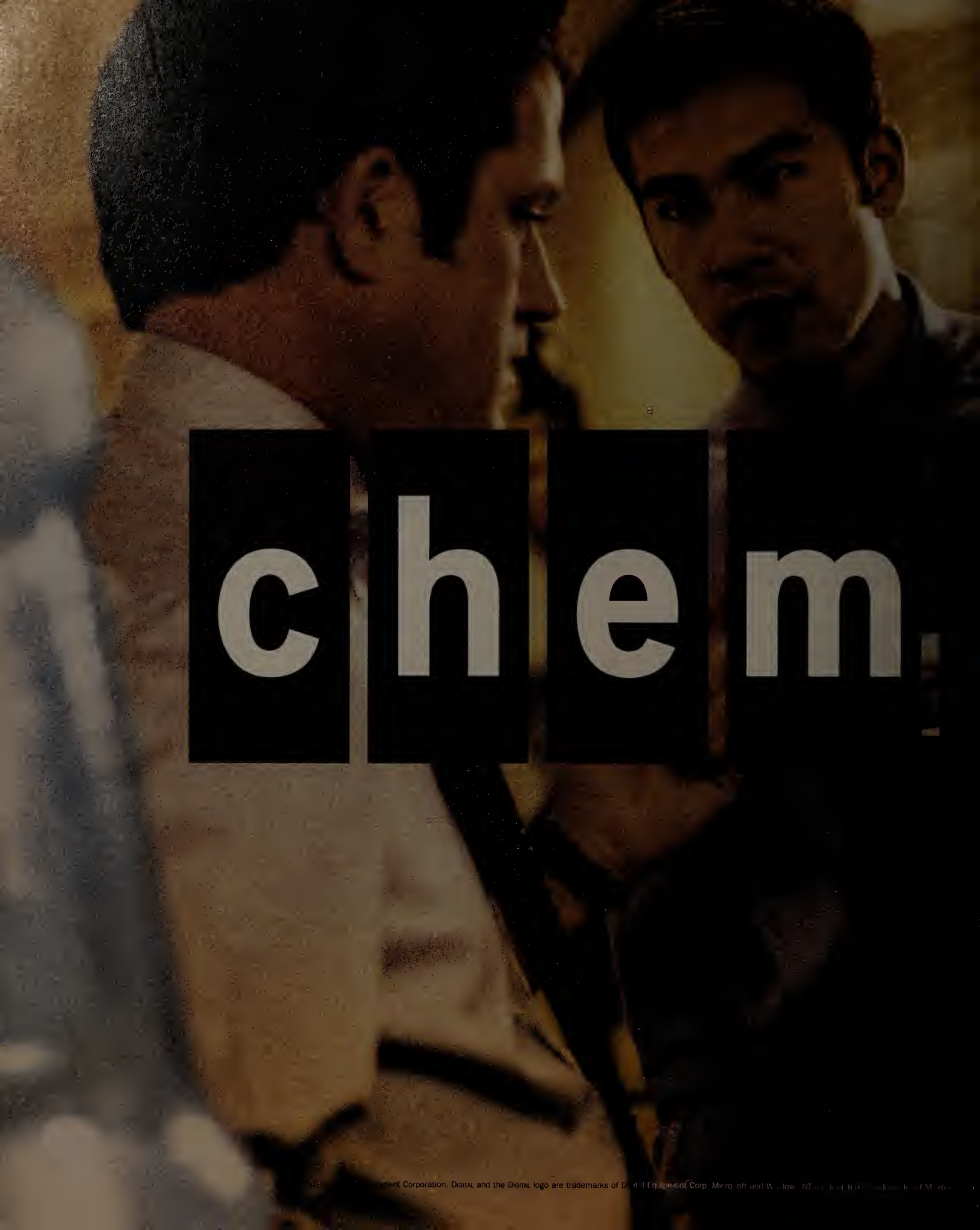
BRING ON THE COMPETITION

According to a survey of 50 *Network World* readers conducted last week, the federal government should let regional Bell operating companies into the long-distance market now to take on AT&T and others.

Make RBOCs wait 20%

Let RBOCs in 50%

For the rest of the survey findings, see page 10.



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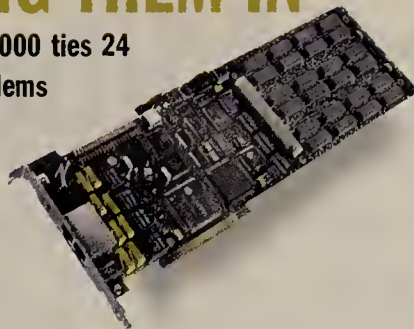
WHAT ARE YOU WORTH?

Consultant Nicholas Faber says the money is out there for net managers. Page 45.

STAN BAROUH

PACKING THEM IN

Ariel's RASCAL 2000 ties 24 56K bit/sec modems on a single PCI board. Page 19.



AGENT OF CHANGE

Rob Barrett sees IBM's Intelligent agent as more than a browser enhancement. Page 27.



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To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.



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This Week

Only on Fusion

Long-distance wrap-up. If you missed our conference last week on whether RBOCs should be allowed into long distance, we've written a summary of the comments — although you also can read all the messages. **DocFinder: 5426**



Keeping Current. And then there were three... Fred McClimans explains why one of the big four internetwork vendors will disappear this year — and why Cisco is going to invest heavily in Gigabit Ethernet. **DocFinder: 5425**

New feature. What are the best Web sites out there for network professionals? What are the worst? Find out with Site Watch, our new series of Web site reviews, starting this week. We'll tell you which sites make finding information and patches easy — and which could use some remedial work. **DocFinder: 5427**

ComNet '98 planner. Get ready for the show with daily tips, breaking news and the Complete Outsider's Inside Guide to Washington, D.C. **DocFinder: 5428**

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News

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SPECIAL FOCUS

Next-generation router architectures

Router start-ups propose different designs for tackling the same problem. Page 20.

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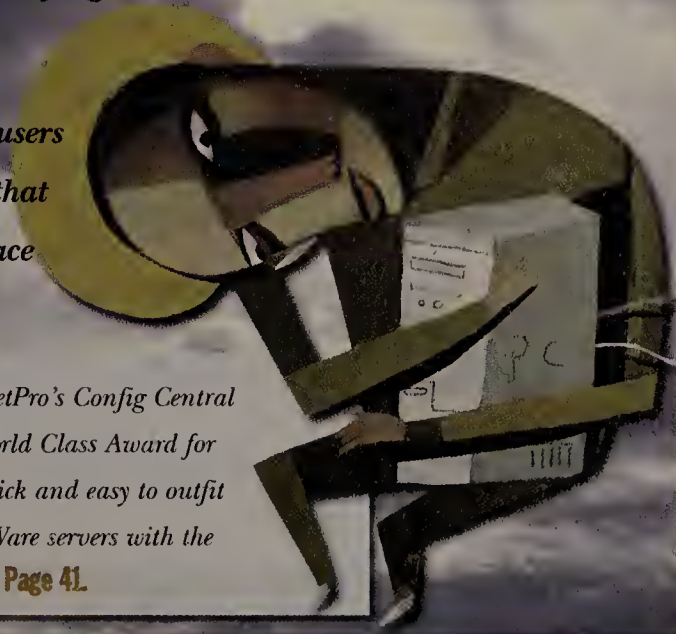
FEATURES

TROUBLE IN THE SKIES? *A pack of providers is wagering upwards of \$50 billion on emerging voice and data satellite services, but who's buying?* Page 1.

THIN-CLIENT SHOWDOWN: *End users will quash the idea that thin clients can replace their PCs.* Page 35.



REVIEW: *NetPro's Config Central earns our World Class Award for making it quick and easy to outfit all your NetWare servers with the latest NLMs.* Page 41.



DAVID SCOTT SINCLAIR

The Software Minute

Extending your enterprise in a connected world.

"IBM Net.Commerce offers the most bang for the electronic buck," according to *Network Computing* magazine. It includes everything you need to do business on the Web. From setup to integration with existing systems to secure payment transactions to administration and business tracking, it's all here. The low-cost Net.Commerce START package is designed for quick implementation and easy entry into e-business. www.internet.ibm.com/commercepoint

Next-generation messaging across the Web. Just released, MQSeries® version 5 includes an Internet gateway for more secure e-commerce across the Web. Other advances: faster performance, support for Java™ clients, closer coordination with database transactions and updates. Bottom line: faster deployment and operation of integrated IT solutions. www.software.ibm.com/mqseries

Universal log-in is simpler for everybody. IBM Global Sign-On gives enterprise users one entry point, one password, for all network resources and applications, including custom applications. Global Sign-On uses IBM Directory and Security Server for secure authentication and storage of user information. The server runs on AIX®, Sun™ Solaris™ and Windows® NT® and supports OS/2®, Windows NT and Windows 95 clients. www.software.ibm.com/gso

Web-enable your Windows NT database in about an hour. With Net.Data™, you can quickly develop sophisticated Web applications based on information in your databases. Net.Data combines the simplicity of HTML with dynamic SQL, helping you transform your business into an e-business. www.software.ibm.com/data/net.data

Browser-based access to host-based data and functions. IBM eNetwork™ Host On-Demand is a fast, easy-to-use, Java-based solution that puts enterprise resources just one click away from users anywhere. It can be loaded on any standard Web server to complement IBM eNetwork Communications Servers and Novell® Netware® for SAA®. www.software.ibm.com/ondemand



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18% of companies expect to have e-commerce applications with electronic payment running by the end of the first quarter, 1998, according to an October 1997 IBM survey of 19,000 companies.

FACT

News briefs, January 19, 1998

FORE looking to buy Sonoma?

■ FORE Systems, Inc. may be looking to buy ATM access equipment maker Sonoma Systems, Inc. Experts last week said FORE is seeking a solid ATM concentration device, and Sonoma's Access line of central office ATM products would fit the bill. Dataquest, a consultancy in San Jose, Calif., said the acquisition would help FORE quickly enter the ATM access market, which is expected to be worth \$1.28 billion by 2001.



FCC: Don't bury us in e-mail!

■ The Federal Communications Commission is trying to squelch a rumor flying around the Internet that the agency has reopened an e-mail comment box on a proposal to impose per-minute access fees on Internet service providers.

Last year, the FCC was buried with nearly 400,000 oppositions to the proposal (NW, March 17, 1997, page 8). Now the rumormongers are misinterpreting a routine request for comments made in preparation for a report due to Congress on the legal status of Internet services, the FCC said. The FCC has released a fact sheet describing what is happening at www.fcc.gov/Bureaus/Common-Carrier/Fact-sheets/ispfact.html.

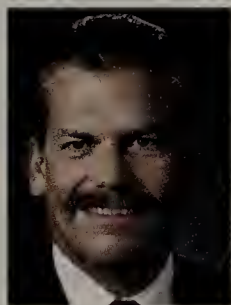
Easing electronic commerce

■ IBM, along with 30 other vendors, last week released a draft of an electronic commerce specification for online storefronts. The specification, called the Open Trading Protocol (OTP), is designed to let different vendors' electronic data interchange and payments software interoperate.

According to IBM, OTP is similar to the existing Open Buying on the Internet (OBI) specification. However, OBI is aimed at business-to-business commerce, while OTP is focused on retail and the consumer. OTP supporters include Hewlett-Packard Co., Sun Microsystems, Inc., MasterCard International, Inc., Open Market, Inc. and Mondex International, Inc. The OTP draft specification is posted for comment at www.otp.org.

Compaq's Pieper bows out

■ Compaq Computer Corp. last week announced that Roel Pieper, former CEO of Tandem Computers, will be leaving his position as Compaq's head of worldwide sales and marketing. Pieper joined Compaq's senior management team last year after Compaq bought Tandem. His replacement will be Michael Heil, former senior vice president and general manager of Compaq's consumer products group.



Roel Pieper is leaving Compaq

Citrix gains new allies

■ Citrix Systems, Inc. last week announced licensing agreements under which IBM and Acorn PLC will embed Citrix's Independent Computing Architecture (ICA) protocol in their network computers (NC). The ICA protocol gives client devices access to applications running on multiuser versions of Windows NT. IBM will use ICA technology in its existing and future NCs, including NetStation. Acorn will add ICA to its Internet appliances.

Netscape refutes layoff count

■ Following Netscape Communication Corp.'s Jan. 5 preliminary analysis of fourth-quarter earnings, numerous press outlets last week indicated that 15% to 20% of Netscape's employees would be laid off.

Netscape would not confirm the figures, calling them speculative. The company indicated that the announcement of an official layoff total would coincide with the company's release of fourth-quarter 1997 financials after the close of the stock market on Jan. 27.

Instant messaging suddenly hot

By Paul McNamara

When speedy communications can make or break a business transaction, "instant messaging" products leave e-mail and the telephone gasping for air, boast those who are trying to sell corporate America on this suddenly hot technology.

But don't jump on this bandwagon too fast, counter the naysayers. Skeptics say instant messaging products, many with roots in the online "chat" world, are inherently handicapped for mission-critical business use and are destined to remain a toy for the home.

Among the most recent developments in this marketplace:

- Activerse, Inc., of Austin, Texas, last week released Version 1.0 of Ding, which, like several competing offerings, includes peer-to-peer messaging, chat, file transfer capabilities and online status monitoring. Price: \$695 for a 25-user package.

- Flash, Inc., a Boston-based start-up, later this month will take the wraps off a client/server instant messaging product, also called Flash, which the company claimed was developed expressly for enterprise customers and their inviolable firewalls. Estimated price: \$20,000 to \$30,000 per 10,000 users, with tiered pricing for smaller businesses.

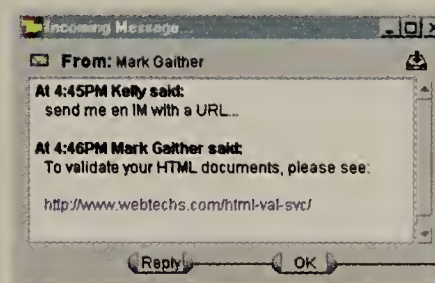
- America Online, Inc.'s entry, Instant Messenger, has been or is being incorporated into products and services from Netscape Communications Corp., Lotus Development Corp., and the Eudora division of Qualcomm, Inc. Smaller players and products jockeying for market position include Drop-Chute+ from Hilgraeve, Inc., of Monroe, Mich., and ICQ from Israeli-based start-up Mirabilis.

While the instant messaging products differ in features, most rely on direct peer-to-peer TCP/IP connections between parties who are online simultaneously, rather than the store-and-forward mechanism of client/server e-mail. Messages appear as pop-up windows in the corner of a user's screen.

"Ultimately, enterprise instant messaging will be like the telephone," said Francis de

INSTANT MESSAGE

Pop-up instant messaging windows, such as this example from Activerse's new Ding software, allow coworkers or business partners to exchange brief messages faster than they can using regular e-mail.



Souza, CEO of Flash. "People will use it for a whole slew of different applications."

Flash touts its client/server product, which runs on Microsoft Corp.'s Windows NT and 95, as "turbo e-mail." The company plans to target time-sensitive industries such as financial services.

"The speed of business gets faster and faster every day, and your ability to communicate quickly is becoming more and more the competitive currency in more and more industries," de Souza said. "Not only are people viewing this as a key part of their customer interactions, but a lot are viewing it as a key part of their supplier

interactions and their internal communications."

One early user of the Activerse entry believed instant messaging will play an important role for companies in the future, particularly those that have dispersed work forces.

"We're kind of a virtual company and have consultants spread out all over the map, working out of their houses and some working on client sites," said J.R. Jesson, CEO of Digital Pilot, Inc., an applications provider and Ding beta tester. "We had a need to find some unobtrusive way of allowing folks to connect to each other, and Ding fits that role very well for us."

The appeal, he added, is as a complement to regular e-mail. Ding also holds the potential for being built into various business applications, he said.

"It's a different channel than e-mail, which makes it almost instantly valuable to me because I get 80 e-mails per day," Jesson said. "So if I want to communicate with a select group of people or the audience of fellow employees in my company, this gives me a self-selecting mechanism."

Despite such testimonials, there are those who believe the instant messaging trend is grounded more in marketing hype than customer need. Skeptics cite a lack of interoperability standards and the need for installing proprietary software on participating desktops as drawbacks.

"We have heard no business reason for doing instant messaging that e-mail doesn't cover," said Paul Hoffman, director of the Internet Mail Consortium, a trade organization based in Santa Cruz, Calif. "Even among our members who do the instant messaging, none of them have indicated that it's mission-critical or even that important."

How instant messaging will play out remains to be seen.

"Having the option of instantaneous or real-time collaboration is a plus," said Mark Levitt, an analyst with International Data Corp., in Framingham, Mass. "It's not something that is going to supplant the entire messaging and groupware infrastructure that's already in place. ■

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NET KNOW-IT-ALL

For the answer to this week's question and more net trivia, visit **Network World Fusion** and enter 2349 in the DocFinder box.

This week's question:

What was the original name of Gigabit Ethernet switch and router start-up Foundry Networks?

www.nwfusion.com



Bay buys way into VPNs with New Oak purchase

By Jim Duffy and Tim Greene
Santa Clara, Calif.

Bay Networks, Inc. last week leapt into the virtual private network (VPN) arena with both feet by announcing plans to acquire start-up New Oak Communications, Inc. for \$156 million in stock and cash.

Bay sought New Oak's flagship NOC 4000 Extranet Access Switch, which packs firewall, authentication and LAN switching in one box. With the NOC 4000 Bay can rapidly offer users VPN services and enter the lucrative extranet services market. VPNs and extranets can save companies \$1,000 per employee per year in long-distance and other telecommunications expenses, Bay claimed.

The worldwide market for VPN and extranet equipment is expected to surpass \$1 billion by 2000, according to research firms Forrester Research, in Cambridge, Mass., and Infonetics Research, in San Jose, Calif.

These firms project VPN and extranet service-related revenue to exceed \$10 billion in the same time period.

PROFILE: NEW OAK COMMUNICATIONS, INC.

Headquarters: Acton, Mass.

Founded: September 1996

Employees: 45

Products: NOC 4000, a remote access box that supports Internet VPNs

Funding: Total of \$12 million from North Bridge Venture Partners, Venrock Associates, Highland Capital Partners

Competitors: Ascend, Cisco

Sale price: \$23 million in cash and \$133 million in Bay Networks stock

public data network," said Bay Chairman, President and CEO David House. "This is the way of the Internet today."

New Oak's NOC 4000 sits at the corporate site and takes in up to six T-1 WAN lines or a single T-3 from the Internet, and connects with an Ethernet LAN.

The NOC 4000 authenticates each user, opens up its firewall, establishes a secure IP tunnel and grants LAN access privileges based on individual user profiles stored in Lightweight Directory Access Protocol directories.

The NOC 4000 will ship in the second quarter.

Bay said the device can be fed by the company's existing remote access offerings, such as the 5399 remote access concentrator and the MX

200 and MX 50 ATM access concentrators, which are based on Yurie Systems, Inc.'s LDR 200 and LDR 50. Bay officials said the company will continue to offer the Yurie-based products.

"[New Oak] really has defined this market," House said. "This gives Bay a significant time-to-market advantage over our competitors," which include Ascend Communications Corp., Cisco Systems, Inc., 3Com Corp. and Cabletron Systems, Inc.



Bay's House: A VPN believer.

"None of the players really have something similar to this, because it's a new class of product," said Craig Johnson of Dataquest, Inc., in San Jose, Calif. "They can bolt together their [products] to get a similar offering, but it's not really an integrated solution set."

Other VPN hardware/software offerings include Shiva Corp.'s VantagePath and 3Access VPN from 3Com (NW, Oct. 6, 1997, page 29).

Bay has a three- to six-month jump on competitors to convince the Internet service provider channel to carry its product, said Maribel Lopez, of Forrester Research. ■

YAGO acquisition puts Cabletron in router market

Cabletron snaps up remaining 75% of Gigabit Ethernet switching router start-up.

By Chris Nerney
Rochester, N.H.

Cabletron Systems, Inc. last week went back on the acquisition trail, snapping up start-up YAGO Systems, Inc.

The \$213 million deal will give Cabletron much needed routing technology for enterprise and Internet service provider networks, analysts said.

YAGO is a Sunnyvale, Calif., maker of Gigabit Ethernet routing switches — devices that are super fast and can make intelligent decisions about where to send traffic based on application profiles.

Cabletron's interest in YAGO was a poorly kept secret. As far back as last September, *Network World* reported that Cabletron had acquired more than a 20% stake in the start-up and might consider an outright acquisition (NW, Sept. 15, 1997, page 1).

The YAGO acquisition met with more positive industry reaction than Cabletron's December announcement that it was buying Digital Equipment Corp.'s Network Product Business for \$430 million in stock, cash and product credits.

"This is really key for Cabletron," said Esmeralda Silva, an

analyst at International Data Corp., a Framingham, Mass. market research firm.

"It allows them to get into

and the priorities it wants to assign to them.

But what Cabletron officials last week left unclear was how YAGO's technology will fit in with Cabletron's existing product line and SecureFast strategy. Cabletron has touted SecureFast as a way to flatten out the network by using the company's "route one, switch many" scheme.

Cabletron CEO Don Reed, who promised more acquisitions this year, said his company will detail plans to integrate YAGO's technology into Cabletron's product portfolio next week at ComNet '98 in Washington, D.C. Cabletron plans to start shipping YAGO products by July.

YAGO's 50 employees will remain at the company's Sunnyvale location, working with Cabletron engineers on the integration of the two companies' product lines. No layoffs are foreseen at this time, according to Reed.

Senior Editor Robin Schreier Hohman and the IDG News Service contributed to this story.



"When it comes to hot start-up companies, YAGO tops almost everyone's list."

Don Reed, president and CEO, Cabletron

the service provider networks, and it gives them a high-end solution to compete against Cisco [Systems, Inc.], 3Com [Corp.] and Bay [Networks, Inc.]," she said.

YAGO's Multilayer Switching Router is capable of switching traffic — at Layers 2, 3 and 4 — at gigabit rates on all ports.

Layer 4 switching is a key feature of YAGO's MSR 8000 backbone switching router. The device extends beyond traditional router functionality by switching Layer 4 (transport layer) application flows, enabling the MSR 8000 to make switch decisions based on the applications a business is using

New Oak catches brass ring

By Tim Greene
Acton, Mass.

Start-up New Oak Communications, Inc. may be named after a winemaking term, but the company clearly didn't take long to age.

When founded 17 months ago, the maker of secure remote access gear was worth, maybe, a little more than \$1 million.



"The real difference for the group here is we're going to have to go to more meetings."

Tom Pincince, founder of New Oak, on being acquired by Bay.

Last week, Bay Networks, Inc. set a new value, with a purchase price of \$156 million.

New Oak's success was a blend of inspiration, talent, hard work, lots of takeout food and the occasional Red Sox game.

The inspiration came from 34-year-old Tom Pincince, the company's founder and executive vice president. While working as an analyst for Forrester Research, Inc., in Cambridge, Mass., he wrote the following in a report: "The Internet will kill the private WAN."

The more he thought about it, the more he believed it. In

August 1996, Pincince quit Forrester and drew up a 12-page proposal for his weapon to speed the death of private WANs.

It was a single box that sits between the Internet and the corporate LAN.

The box acts as a firewall, authenticates users, creates a secure IP tunnel, grants customized access based on individual user Lightweight Directory Access Protocol profiles, and then generates call and billing information.

Remote users, business partners and workers at other corporate sites would go through the Internet to access corporate resources. Dial-up users could do it for the price of a local call to an Internet service provider.

Pincince took the proposal to Ed Anderson, managing general partner of North Bridge Venture Partners, who had shot down one of Pincince's earlier start-up ideas. This time, though, Anderson liked what Pincince had to say. A month later New Oak was incorporated, and within a year the company had \$12 million in venture capital.

Pincince went to work in a single room in North Bridge's offices, supplied with a desk, a chair, a phone and a borrowed 386 PC. He hired Dan Boudreau as vice president of engineering and together they hired top-notch people they already knew. They asked the new hires to recommend others. But because New Oak demanded total secrecy, candidates were not told what they would be working on until the third or fourth inter-

See New Oak, page 14

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Users willing to give new telecom mergers a try

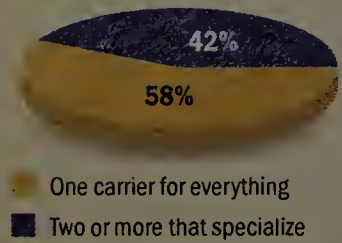
Network World survey shows users expect new services, better WAN services in return.

By David Rohde

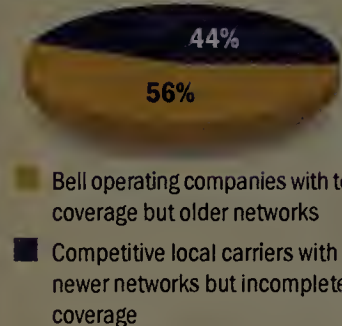
By a narrow margin, users are giving thumbs up to the idea of carrier consolidation if that

NETWORK WORLD READERS' TELECOM OPINIONS

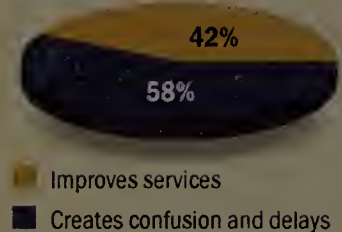
For all your voice and data needs, would you prefer:



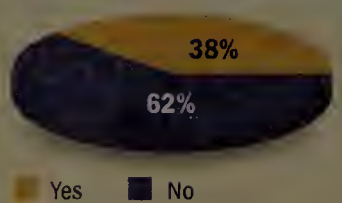
In choosing merger partners, long-distance carriers should select:



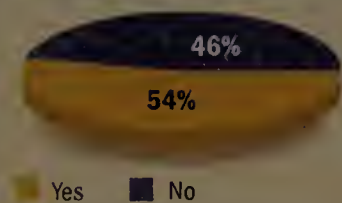
When carriers merge, it more often:



Do you want your Internet access service to be provided by your traditional telecom carrier?



Do you think AT&T's acquisition of TCG will benefit customers?



Based on a Network World survey of 50 readers conducted by First Market Research, of Austin, Texas.

union delivers unified, end-to-end WAN services.

But users are demanding a *quid pro quo*: a quick end to the telephone company legal wars, with full freedom for regional Bell operating companies to offer long-distance service.

That is the result of a *Network World* survey of network IS managers. *Network World* last week conducted the survey following AT&T's announcement that it will purchase Teleport Communications Group, Inc. (TCG), a competitive local exchange carrier with broadband metropolitan-area fiber networks.

"That would be great. We could do everything with AT&T and not deal with Pacific Bell," said AT&T user Tim Rivers, MIS director for Xicom Technology, Inc., a satellite equipment maker in Sunnyvale, Calif.

Rivers is withholding judgment on AT&T's execution of the TCG deal, though. "Pacific Bell was absolutely, completely screwed up in its merger [with SBC Communications, Inc.]," he said. During the merger, responsibility for his account was transferred to representatives in Southern California who did not understand the Northern California market, he said.

Even with his disdain for the local RBOC, Rivers, like many other network managers, is growing weary of arguments by AT&T and MCI Communications Corp. that RBOCs must be limited to offering services within their local exchange areas for now. "I don't see why they shouldn't be allowed into long distance now," Rivers said, noting that Brooks Fiber Properties, Inc. and the local division of MCI merger partner WorldCom, Inc. have already arrived in Sunnyvale.

For one group of network managers — those in government — the consolidation trend may even boost competition. Bound by government contracts, Kirk Farah, chief information manager of the Army Corps of Engineers' Great Lakes region, said he is obligated to use AT&T for private lines and Ameritech Corp. for local ISDN and analog access.

Bringing TCG under AT&T's wing would open up the possibility of a new supplier of access circuits on state-of-the-art facilities — an important point even if no

cost savings result from the merger.

"Reliability is the biggest factor, and I don't think you can put a price tag on network outages," said Farah, who is based in Chicago. "This is going to give me a little more leverage."

There were some disquieting factors, though. Users are not convinced that AT&T and MCI will be ready for nationwide battle simply by bringing new competitive local access providers into their folds.

Noting the still-limited areas

served separately by MCI, WorldCom and Teleport, a majority of users said it could take purchasing the more comprehensive local coverage of an RBOC for the long-distance carriers to provide local access throughout the country.

That is a concern for Dawn Sutherland, network administrator at Atlanta-based Regency Realty Corp., a property management firm that has been involved in several mergers.

Sutherland has been busy integrating voice and frame relay

nets in various areas and is not certain that competitive local access providers, some of whom are brand-new to many towns, have enough coverage or a long enough track record. "I just don't have the total warm and fuzzies about them yet," Sutherland said.

And there continues to be resistance to Internet service providers willy-nilly joining with traditional telecom carriers. ISPs provide more personalized service than occasionally hard-to-deal-with telcos, Rivers said.

But Farah disagreed, saying he felt more comfortable with larger carriers providing the whole package. "You don't always know exactly who these people are," Farah said of ISPs. ■

Microsoft, Netscape back new security standard

By Ellen Messmer

San Francisco

Microsoft Corp. and Netscape Communications Corp. may not agree on much, but they believe in replacing the most widely used security on the 'Net today, Secure Sockets Layer 3.0 (SSL), with a stronger brew, Transport Layer Security (TLS).

Invented at Netscape, SSL is widely used in a variety of vendor products, including 30 million browsers and more than 42,000 secure servers worldwide, as the primary means to encrypt information.

However, the industry appears poised to retire SSL in favor of the new Internet Engineering Task Force (IETF) standard, TLS, which mandates support for Triple-DES encryption.

"TLS will go into the next major versions of our products," said Barbara Fox, security architect at Microsoft, who believes users will see it in everything from the operating system, Web servers and browsers to the financial package Microsoft Money.

At Netscape as well, products that had used SSL — such as Web servers and mail servers — are going to support TLS, said Netscape Senior Scientist Taher ElGamal. The current financial turmoil at Netscape makes it hard to predict precisely when that will be, he acknowledged.

Vendors are switching from SSL to TLS in order to make stronger encryption available on the 'Net, and to make minor improvements to SSL in areas such as error message handling.

In addition, SSL is a session-layer protocol used mainly for

TCP/IP streaming data, but TLS will work with other transport protocols, such as NetWare SPX, AppleTalk, and even cellular phone systems.

The IETF working group developing TLS had actually

Netscape are pledging that their client/server products will be able to recognize either protocol and default to the appropriate setting.

The fact that TLS mandates strong encryption which cannot

The nuts and bolts of Transport Layer Security

- Transport Layer Security (TLS) 1.0 is an IETF standard that will widely replace Secure Sockets Layer (SSL) 3.0 in a new generation of Web browsers, servers and Windows operating systems.
- TLS brings technical changes to SSL that include fully specified message order, random pad blocking and additional error warning alerts.
- To promote security interoperability, the IETF has decided that TLS must have mandatory strong encryption, which means vendors will be forced to have separate domestic and international versions of TLS because of U.S. export restrictions on cryptography.
- The mandatory ciphersuites include Triple-DES, the Secure Hash Algorithm, Diffie-Hellman key-exchange and Digital Signature Standard.
- The text of TLS is available on the Web at www.consensus.com/ietf-tls/.

wanted to leave out mandatory strong encryption, but it was overruled by the Internet Architecture Board, said Winn Triesse, director of security at Open Market, and chair of the IETF TLS Working Group.

Heading off trouble

SSL has limited alert messages that only tell users when the SSL connection has failed, said Tim Dierks, director of engineering at Consensus Development Corp., and co-editor of the IETF TLS protocol. In contrast, "TLS allows you to say why the connection is not proceeding, which should be of help in troubleshooting," Dierks said.

TLS is not backward-compatible with SSL, but Microsoft and

be exported without special permission from the U.S. Department of Commerce will present a problem for U.S. corporate buyers purchasing on behalf of their international offices.

Microsoft's Fox acknowledged the problem, adding, "Well, we're going to have TLS out because we've got to solve the export problem sooner or later [anyway]."

Last week, C2Net Software, a British firm, announced it had the first implementation of TLS on a test server. Doug Barnes, C2Net's vice president of development at the company's Oakland, Calif., office, said C2Net is not being slowed down by U.S. encryption restrictions because it is already offshore. ■

Java apps, new platforms on Lotus' agenda



By Paul McNamara
Cambridge, Mass.

Thin-client applications, big-iron platforms and fresh details about the next upgrades of Lotus Notes and Domino will share center stage next week at Lotus Development Corp.'s annual customer conference in Orlando.

Tickets to Lotusphere '98 are being scalped on newsgroups as if they were seats at the Super Bowl. The more than 9,000 business partners and customers who have scored badges can anticipate Lotus officials detailing:

- The imminent release of eSuite, a collection of Java-based productivity applets designed to run on and spur sales of network computers (NC), in particular the Network Station from Lotus' parent company, IBM.

- Long-promised versions of Notes and Domino that will run on IBM's AS/400 midrange and S/390 mainframe computers, as well as a host of third-party Notes-based applications written specifically for these platforms.

- Fresh information about Versions 5.0

of the Notes messaging/groupware client and the Domino Web/application development server. These upgrades were originally slated for release at this show, but they will now be delayed until the end of summer or later.

Although Lotus has yet to flesh out a sales and distribution plan for the eSuite

applets, and the jury remains out on NCs in general, one beta tester last week said he has high expectations for the combination.

"[The eSuite applications] really are high-powered building blocks for use in larger" applications, said Jim DeFrisco, co-owner of Siena Hill, Inc., an applica-

tions development group in Danville, Calif. "They provide a pretty amazing level of utility for the cost, as far as size and download time."

Others may require more convincing, however. "I would question more the stability of the applets — because it's a first version — than the functions themselves," said one potential customer who attended Lotus' glitzy eSuite kickoff event in November (NW, Nov. 10, 1997, page 14). ■

NSI eases domain name registration

By Sandra Gittlen

Now you can phone in your domain name registration.

In an attempt to appeal to the masses, Network Solutions, Inc. (NSI) last week announced WorldNIC Services, a program that lets companies and individuals

register for domain names in five easy steps via the World Wide Web or telephone. While the previous system required users to submit an e-mail form to NSI and could take a day to confirm the request, a WorldNIC registration takes less than 90 seconds, NSI claimed.

For \$110, users can reserve or register for .com, .net or .org domain names. Within 24 hours, the registered domains could be up and running, according to NSI. In addition, users no longer need to secure an Internet service provider before registering, NSI said.

Users enter a suggested domain name

at www.worldnic.com or by calling (888) 642-9675. The WorldNIC computer then checks if the name is available. If not, RegistrationPlus, the first part of NSI's WorldNIC service, will offer alternative names using NSI's proprietary software.

A big plus for the service is its direct connection to the central Internet registry, InterNIC, which NSI also runs.

However, if the unrest surrounding domain name registration continues, NSI may no longer have control of this process. The domain name registration process is now being reviewed by Ira Magaziner, President Clinton's top Internet adviser, who is considering several proposals to bring competition to the procedures. ■

Go online to read our interview
with Clinton's Internet adviser,
Ira Magaziner.

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Mgmt. showdown to take center stage at ComNet

By Jim Duffy

Washington, D.C.

Vendors are still talking the integrated enterprise management talk — now we'll see who can walk the walk.

At the ComNet '98 show here, *Network World's* Network and Systems Management Showdown will attempt to get beyond the hype about enterprise management to determine just how all-encompassing it is, how integrated it is and who can really deliver all of the pieces.

The showdown will feature a pair of industry analysts who will grill management gurus from

Cabletron Systems, Inc., Computer Associates International, Inc. (CA), Hewlett-Packard Co., IBM/Tivoli Systems, Inc. and Sun Microsystems, Inc. with technical questions, hoping to find out what is real and what is not about their network and system management offerings.

One of the analysts doing the questioning said he will push hard on the issue of implementation.

"The No. 1 challenge [for users] after they've bought into the [vendor's scheme] is that it's very hard for them to use it for more than one thing," said Rick

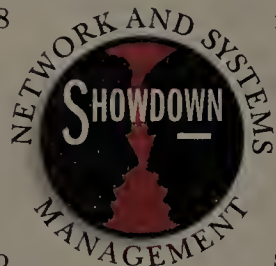
Villars, director of network management at International Data Corp., a consultancy based in Framingham, Mass. "I want to know both the ease of initial setup [and] what these guys are doing with regard to follow-up to help the customers get more use out of their initial investments."

Villars also wants some details on how vendors plan to use directory services with their management products. "It's part of that same issue of letting users take advantage of resources more effectively," he said.

Lastly, Villars wants to know how CA, traditionally strong in systems management, will improve its network management

capabilities.

Other issues expected to be expounded on include management frameworks vs. integrated management application suites, service management and where Sun's management vision has been for the past four or five years. ■



Who: Representatives from HP, IBM/Tivoli, Computer Associates, Sun and Cabletron. Panelists include Kevin Tolly of The Tolly Group, Rick Villars of International Data Corp. and Senior Editor Jim Duffy of *Network World*.

What: A presidential-style debate in which vendor participants will field questions from a panel of experts, each other and audience members.

When: 12:30 p.m., Thursday, Jan. 29

Where: ComNet '98 in Washington, D.C., Renaissance Hotel

Scheme for mammoth global network draws carrier attention

"Super Internet" would offer less-expensive, high throughput bandwidth.

By Rob Guth

Honolulu

The most ambitious global network construction scheme that has ever been conceived drew praise and criticism when the father of the plan boldly told telecommunications industry executives that if they do not join him, their companies will die.

Neil Tagare, chairman and CEO of CTR Group, Ltd., last week said Project Oxygen, as the plan is called, will be the foundation for a future "Super Internet" on which all types of communications, from simple text to video will travel. Tagare was speaking to attendees at the annual meeting of the Pacific Telecommunications Council here this week.

The grand plan, first announced last year, has turned heads in the telecom industry for its huge scale — it aspires to wrap the world in 198,400 miles of fiber-optic cable by 2003 for a cost of \$14 billion — and for Tagare's penchant for making bold promises about what the project will deliver.

"We call it Project Oxygen because carriers who join us will survive, and carriers who don't join us won't survive," Tagare said.

Tagare promised Oxygen will provide 265 end points in 171 countries with a minimum bandwidth of 320G bit/sec. The network will use ATM switching. In addition, Wavelength Division Multiplexing technology will be

used to squeeze more bandwidth from the cable, Tagare said.

"Project Oxygen will never ever become technologically obsolete or obsolete on price, that is a guarantee," Tagare said.

Project Oxygen also will allocate 20G bit/sec of free bandwidth worldwide for video content providers, such as television stations, to distribute, resell and package video and television services, Tagare said.

Tagare predicted that the network will be 100 to 500 times less expensive than existing high-bandwidth infrastructures such as satellite and other cable projects.

But before Project Oxygen can save carriers money, it will

spend it — Tagare is traveling the globe trying to drum up the project's full \$14 billion capital by December 1998. "My goal is to travel one continent a month," he said. Initial backers include

Alcatel Submarine Networks, and Tyco Submarine Systems, Ltd., as well as Japan's NEC Corp., NTT International Corp., Sumitomo Corp. and Mitsui & Company, Ltd.

Tagare's presentation drew heated comments and questions from the audience — many of whom provide fiber-optic and satellite systems — but several of the audience members said Tagare's grand plan is on the right track. "It's ahead of its time, which is

not to say it won't fly," said James Savage, vice president, public affairs international at GTE Service Corp. "If you really believe the price of bandwidth will drop like a stone and the Internet will move to video, all the bandwidth we have will be eaten up."

Audience members noted that Tagare's goal of raising \$14 billion over the next 11 months is "ambitious," but they added that he was a prime force behind the creation of the 17,360-mile Fiber-optic Link Around the Globe (FLAG) network, which already is in operation.

"In 1992, people were smiling and skeptical about FLAG, and now it exists," Savage said.

CTR Group, with headquarters in Woodcliff Lake, N.J., can be reached at (201) 505-9000 or www.oxygen.org/.

Guth is a correspondent with the IDG News Service's Tokyo bureau.

CTR Group raised \$1.4 billion in one weekend last month for Project Oxygen at a symposium in Las Vegas. Identities of the Las Vegas investors have not been disclosed.

Novonyx ships software amidst uncertainty

By Christine Burns and Chris Nerney

Despite widespread talk of managerial turmoil at Novonyx, Inc., the Novell, Inc.-Netscape Communications Corp. joint venture last week got its first products out the door.

Novonyx was formed seven months ago to port Netscape's SuiteSpot software to NetWare. The company last week started

shipping Netscape Enterprise Server for NetWare, a scalable Web server for managing and hosting Web applications; Netscape Messaging Server for NetWare, an Internet standards-based electronic mail system; and Netscape FastTrack Server for NetWare, a low-cost, high-performance Web server for small workgroups.

The enterprise Web and mes-

saging servers start at \$1,295. The FastTrack Server costs \$295. Meanwhile, neither of the companies would confirm reports that Novell had ousted top Novonyx officials, including CEO Robert Hicks, or that Novell was taking complete control of the venture. A Novell spokesman said that there will be a number of executive changes at Novonyx over the next few months. ■

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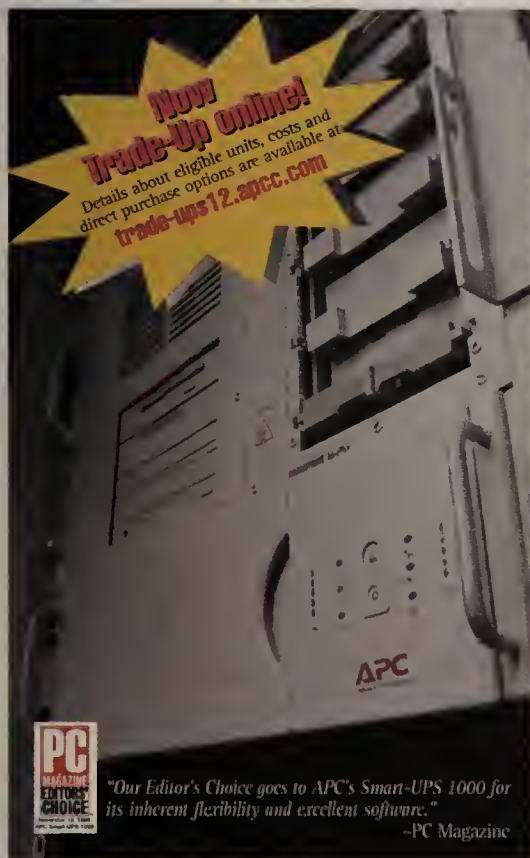
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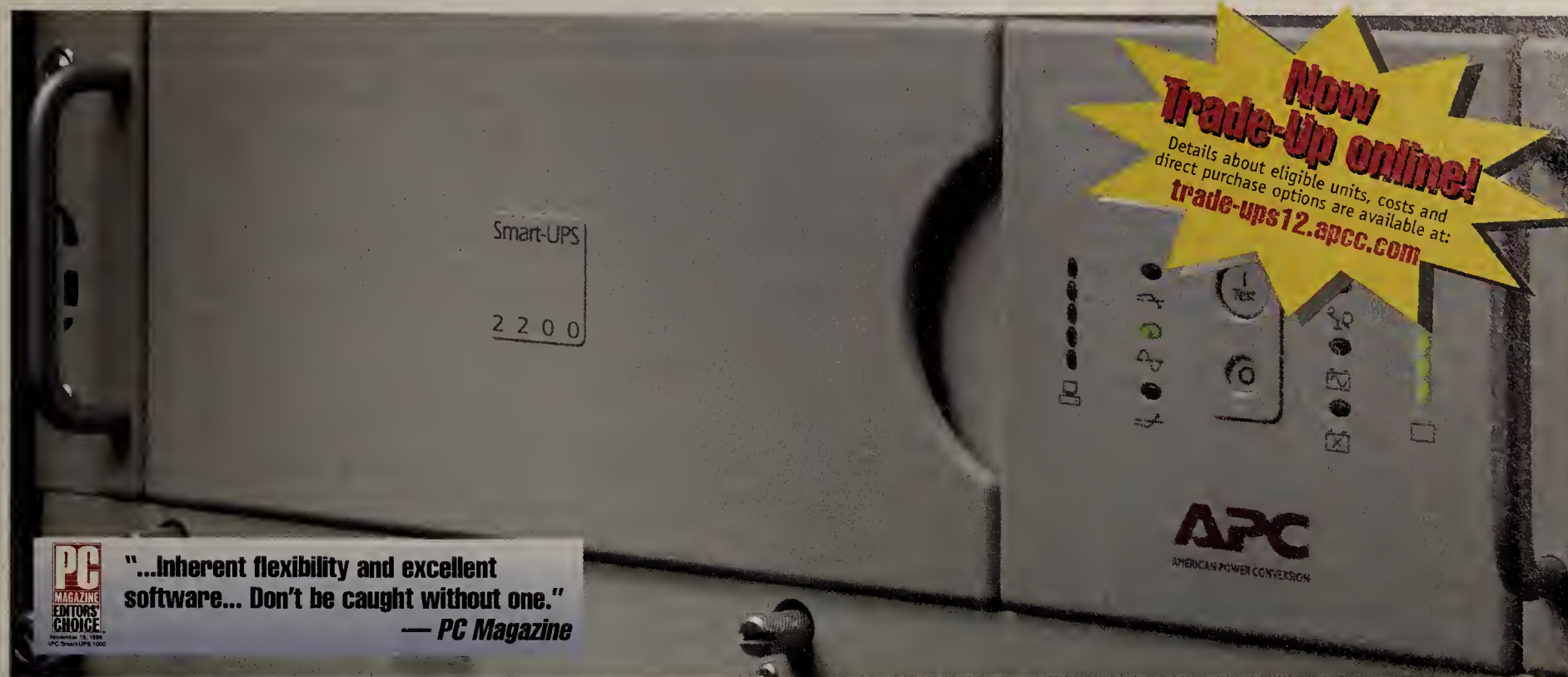


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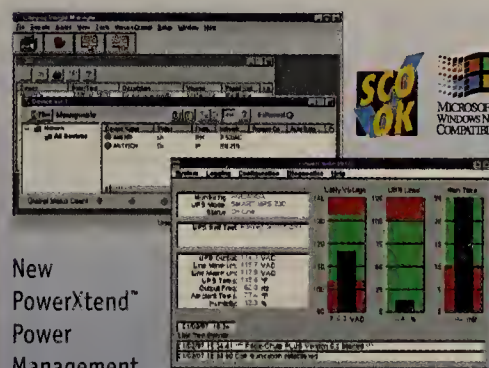
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Java taking on expense report automation

By Chrls Nemej
Emeryville, Calif.

As far as start-up launches go, they don't get more high-profile than this.

Extensity, Inc. tomorrow will unveil its first product at a press conference featuring two of the biggest stars in the Silicon Valley constellation: Sun Microsystems, Inc. CEO Scott McNealy and venture capital legend John Doerr.

The product, Extensity Expense Reporter, is a Web-based application that automates the expense reporting process for corporations. The company's client/server software is written in 100% Java.

McNealy and Doerr will be at the event because they share an interest in Extensity. Sun has a partnership with the company, while Doerr's venture firm, Kleiner Perkins Caufield & Byers, has invested \$7 million in Extensity through the firm's Java Fund.

The appearance by McNealy

and Doerr also serves a larger purpose — to underscore the importance Java investors put on rolling out enterprise applications to an impatient market.

For the past two years, Java supporters have promised that applications developed in the cross-platform language would transform the way corporations conduct business and run their networks. Such products, however, have been slow in coming to market, in large part because Java development tools have not been up to the task of building enterprise-level applications.

Expense Reporter, for example, is being released more than two years after Extensity was formed, in January 1996, under the name @Large.

"There were no tools when we started developing in Java,"

Extensity President and CEO Sharam Sasson said. "We had to work through that."

But with the introduction in recent months of more

PROFILE: EXTENSITY, INC.

Headquarters: Emeryville, Calif.

Founded: January 1996, as @Large, Inc.

Employees: 50

Funding: \$7 million from Kleiner Perkins Caufield & Byers (Java Fund), Hummer Winblad Venture Partners, and Weiss, Peck & Greer Venture Partners

Product: Expense Reporter, a Web-based Java application that automates the corporate expense report process

Fun fact: The company had to change its name last year because Ziff-Davis, Inc. had trademarked @Large.

advanced Java development tools such as Enterprise Java-

Beans, the trickle of Java-based enterprise applications is turning into a flow.

"I would be astonished if we didn't see 50 or 60 products coming out of the JavaOne conference in late March," said Anne Thomas, a senior analyst with Boston-based Patricia Seybold Group, Inc.

Expense Reporter creates reports by importing data directly from employees' corporate credit card statements, which are downloaded from credit card companies by Extensity customers at predefined intervals.

The server component of Expense Reporter includes a workflow engine that routes expense reports to the appropriate people and a rules engine that checks expense reports against preset corporate policies.

The server software also features a data manager that sends information from the server to the client and from the server to other enterprise applications and databases that may contain relevant data, such as a list of all employees.

The thin-client software uses a graphical user interface browser interface and configurable account codes. Traveling employees can retrieve their expense information from remote sites or once they get back to the office.

Expense Reporter's server software runs on Windows NT, Solaris, HP-UX and IBM's AIX. Client platforms supported include Windows 95 and NT, Macintosh and Solaris, as well as browsers from Netscape Communications Corp. and Microsoft Corp. The Extensity software also supports databases from Oracle Corp., Microsoft, Sybase, Inc. and Informix Software, Inc.

Expense Reporter will be available later this quarter. Extensity will announce pricing tomorrow.

© Extensity: (510) 594-5700

Digital prepping NT-only Alpha server line

Company also readying Pentium-based servers, clustering technology.

By Marc Songlin
Maynard, Mass.

Digital Equipment Corp. has big plans for its Alpha-based servers this year.

Next week, Digital plans to announce a new line of Windows NT servers, reportedly called DigitalServers, with three new Alpha/NT boxes. There also will be four new Pentium-based NT servers included in the line.

The Pentium-based servers, beginning with the DigitalServer 1000, reportedly will handle from one to eight chips; the new Alpha boxes scale from one to four.

It also appears that Digital is looking to make the Alpha-based products in its DigitalServer line more attractive to buyers of today's commodity-style Intel-based boxes. The main weapon here is price. Sources close to the company claimed that the new Alpha-based DigitalServers will be much less expensive than Digital's current AlphaServer line.

"Digital is getting very aggressive with Windows NT on Alpha," said Terry Shannon, an Ashland, Mass.-based analyst and author of the "Shannon Knows DEC" newsletter.

The DigitalServers will range

from basic workgroup boxes to high-end enterprise machines.

The base price of an entry Alpha-based DigitalServer, the 3300, will probably be about \$4,000; the midrange box, the 5300, will cost about \$7,000. The Pentium boxes will be a little less expensive than the Alpha machines, sources said.

Shannon also said Digital "will swallow its pride" and issue Alpha-based chips that will be "lobotomized" and unable to work with Digital Unix and OpenVMS servers. The NT-only chips will reportedly be less expensive that way.

Digital will continue with its AlphaServer line, which runs OpenVMS and Digital Unix.

New AlphaServer offerings will fall into four categories, Shannon said. There will be one- to two-processor workgroup servers; one- to four-processor midrange boxes; high-end midrange servers with up to eight chips; and enterprise servers handling between eight and 32 chips.

Wildfire to spread

The technological peak of the year for Alpha-based servers will be the introduction of "Wild-

fire," a box that now is in prototype form and should ship before year-end, Shannon said. Wildfire will offer up to 32 processors and 128G bytes of RAM.

Wildfire will be built around motherboards containing eight CPUs each; the boards will attach via peer-to-peer crossbar switches, Shannon said. This architecture ultimately will allow Wildfire to hold as many as 100 chips.

Clustering with Microsoft

Later this month, Digital also will be announcing its new NT clustering strategy. Working closely with Microsoft Corp., Digital will integrate high-end OpenVMS clustering technology with Microsoft Cluster Server, said Phil Cahan, marketing manager for Digital's NT clustering and Windows NT products.

Right now, Microsoft's Cluster Server software enables users only to do simple functions, such as enabling the link-up of two servers for failover operations.

Cahan said that with Digital's OpenVMS technology, NT will be able to exploit clustering potential much more efficiently,

although much of the technology will have to wait until Microsoft's NT Enterprise Server 5.0 comes out late this year or sometime in 1999. Sources said Digital will soon announce that it will be rolling out preconfigured server systems ready for clustering.

Among the functions to be added will be job scheduling, a

mainframe-style application that allows users to distribute applications over multiple servers.

There also will be enterprise-level data sharing and storage applications added, to increase reliability and availability of servers. Sources said disaster tolerance capacity would be announced for NT later this year. ■

New Oak

Continued from page 8

view. "We were telling them, 'You don't know me, but we're building something cool,'" Pincince said.

They worked hard to meet project deadlines. Pincince and Boudreau routinely bought take-out food and served it themselves to fuel late-night work. Nobody wanted to come in Monday morning and say they failed to meet their work goal, and that motivated people to work harder and longer.

After one deadline, everyone piled into a bus and went to Fenway Park for a Red Sox game. There, Boudreau, Pincince and CEO Jeff McCarthy hustled back and forth to the concession stands ferrying beer and hot dogs for the others.

Last September, New Oak lifted the cloak of secrecy and

announced what the company was up to.

Soon, Bill Hawes, Bay's chief technical officer who already knew Pincince, was sniffing around. The box fit into Bay's scheme for remote access.

Suddenly, they were talking price, \$156 million, and a promise to keep running the company the way they had. New Oak accepted. Everyone who worked at New Oak did well.

One worker told his son to apply to any college he wanted; the family could afford it. Another realized he no longer had to buy a used minivan; he could buy a new one.

Pincince went home and drank champagne but was back on the job the next day. He wouldn't say how much of the \$156 million is his, but Pincince said it's enough to let him splurge on his wife and daughter as well as see if he can find a black Porsche with his name on it. ■



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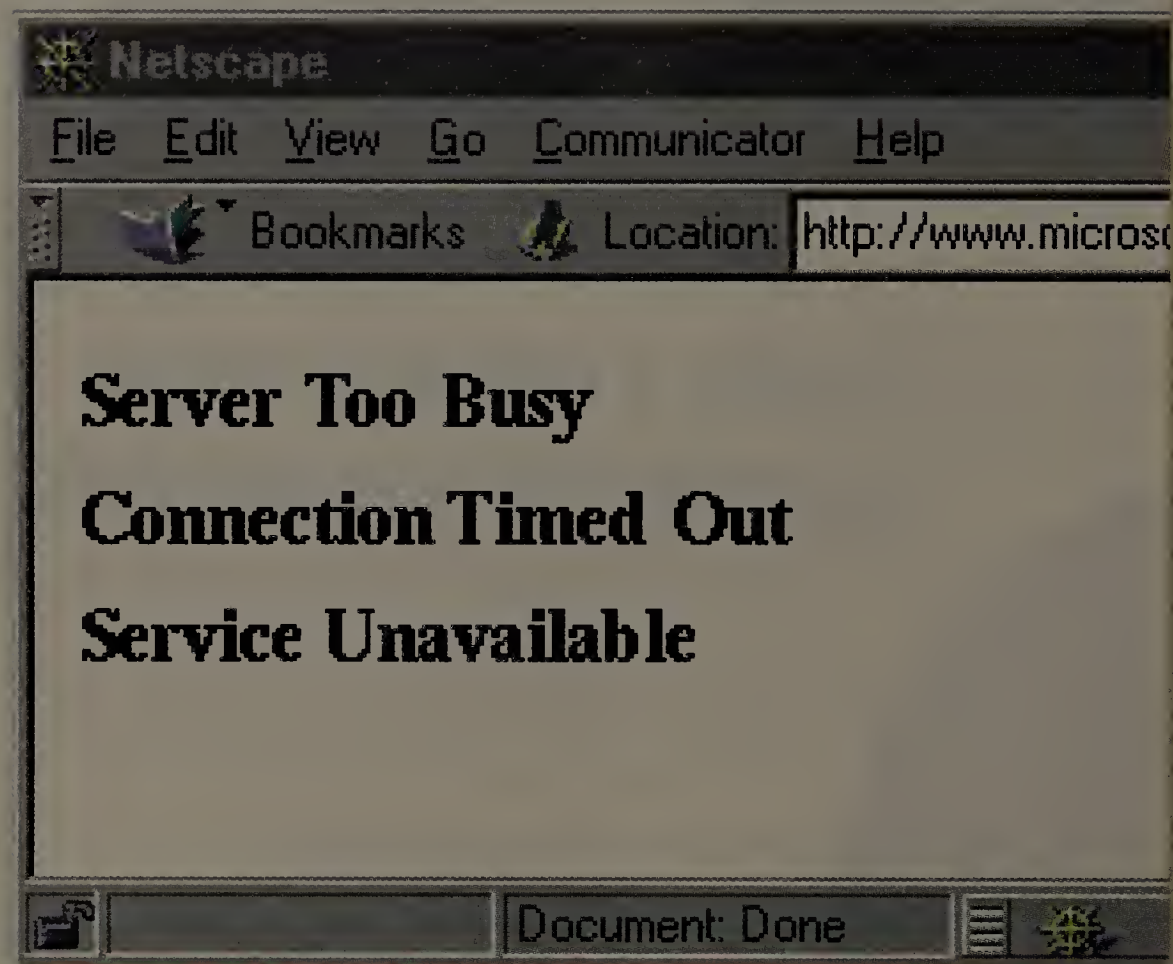
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■ **NBase Communications** has dropped the price for its **MegaSwitch NH 234** from \$117 per port to \$88 per port. NBase, which analysts said has one of the most complete LAN switching product portfolios in the industry, will sell the MegaSwitch NH 234 for \$2,995, \$500 less than the original \$3,495 price.

The NH 234 is a midrange stackable workgroup switch that offers 32 10M bit/sec ports and two 100M bit/sec uplinks.

■ **Intel Corp.** has hired 64 hardware design engineers from NCR Corp. to bolster its **enterprise server division**. NCR is ceding its basic chip development division to Intel, but expects to purchase the Intel eight-way server technology when it becomes available.

Intel will now have a presence in South Carolina; the newly hired engineers will stay put to form the Intel Columbia Design Center.

■ **Cabletron Systems, Inc.** last week announced its **SmartSwitches** have passed speed, interoperability and reliability testing, qualifying them for use in the U.S. Navy's Information for the 21st Century project. The project will upgrade the network architectures for the Atlantic and Pacific fleets.



Cabletron's SmartSwitches have passed the Navy's tests.

Two SmartSwitch 6000s passed tests for plug-and-play installation, quick device location and true multivendor ATM interoperability via Private Network-to-Network Interface (PNNI).

OneBOX switch combines ATM, Fast Ethernet

By Robin Schreier Hohman



Silicon Valley start-up OneBOX Networks, Inc. will announce a new 16-port Fast Ethernet IP-virtual LAN switch with an ATM uplink at next week's ComNet '98 in Washington, D.C.

The ON-516A will be the company's second product to ship, and is designed for workgroup applications that demand high performance and for large computer and carrier companies.

The product, which is essentially a hub, switch, router and firewall in one box, is slated to sell for just under \$10,000.

The ON-516A features 16 half/full-duplex, autosensing ports and will be able to accommodate wire-speed 100M bit/sec IP switching on all 16 ports simultaneously, the company claimed.

The ON-516A also supports up to 64 subnet IP VLANs and has a Java-based Web browser network management interface with SNMP and Remote Monitoring (RMON) support. Its throughput capacity is 3.5 million packet/sec on the switch side and 155M bit/sec OC-3

support over the ATM uplink, which is based on a dedicated processor.

PROFILE: ONEBOX NETWORKS, INC.

Headquarters: Westlake Village, Calif.

Founded: September 1996 (as OfficeNet, changed name last September)

President/CEO: Paul Singh, founder of Memotec, previously at Micom Systems

Funding: \$3.5 million to date out of a total \$6.5 million committed by Amerscan III

Employees: 30

Products: An all-in-one solution for hubs, routing, switching and firewall

"OneBOX is not producing just a fast bridge and calling it a switch," said Martha Young, an analyst at Cutting Edge Information Group, in Boulder, Colo. Young pointed out that the ON-516A's Java-based Web management, RMON support and VLAN capabilities will make the unit attractive to IS managers who need the raw power but may not be on site to troubleshoot.

OneBOX, which started life as OfficeNet in September 1996, changed its name to OneBOX Networks, Inc. a year later. In the

company's early stages, during research and development, the company developed the ON-

100, an eight-port, 10/ 100M bit/sec switch, for an Internet service provider. The product was so successful that founders Paul Singh and Al Cummins, both formerly of Micom Systems, decided to add Java-based Web management,

increase the raw speed and release the product commercially.

One of its first customers was in Massachusetts, at the town-owned Shrewsbury Electric Light Department and Shrewsbury Community Cablevision. Shrewsbury Light & Cable, as it is known, has been using two ON-100s for nearly two years, according to Fran Paika, manager of engineering and computer services. He uses one to separate traffic on two Synchronous Optical Network (SONET) rings, and the other to get out to the

Internet.

"When we wanted to go to Internet service, that was the only unit that could do everything. It could route, it could switch and it could send," Paika said. Shrewsbury Light & Cable serves about 12,000 power customers and about 12,000 cable customers.

Paika, who said he is very satisfied with the company and the product, said he would consider upgrading to the ON-516A if he could, but he first has to move the network up to Fast Ethernet.

OneBOX plans to begin shipping the ON-516A next month. The company will introduce the ON-516G, a similar product with a Gigabit Ethernet uplink, at NetWorld+Interop in May. Pricing for that product was not available. OneBOX also will produce a model without a Gigabit Ethernet or ATM uplink for \$4,950.

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HP print server catches Fast Ethernet wave

Server works on a variety of operating system platforms.

By Marc Songini
Palo Alto, Calif.

Hewlett-Packard Co. announced that it has added Fast Ethernet capability to its JetDirect print server line.

HP's new JetDirect 300X external print server, along with the company's Web JetAdmin 3.0 management software, is designed to help IT managers migrate their networks to Fast Ethernet. The server also supports 10Base-T Ethernet environments and can autonegotiate between 10Base-T and Fast Ethernet.

The company claims the product will work with HP's and other vendors' printers. HP already offers print servers for



The new HP JetDirect 300X print server allows for a Fast Ethernet transition.

token ring and 10Base-T Ethernet networks.

A print server, usually just a CPU with a storage disk, gener-

ally controls one or more printers in a network.

The 300X, which is the size of a videocassette, has a small built-in light display to tell IT managers if they are connecting to a 10Base-T or Fast Ethernet network.

This is particularly useful for companies still in transition from Ethernet to Fast Ethernet, the company claimed.

"IT managers have 10Base-T and 100Base-TX workgroups in the same area of the building, and what this does is make it easier when they hook up the print server," said Dani Weinstein, worldwide product manager for JetDirect. Managers do not have to go tracing

the wires to verify which speed connection they are working on.

HP emphasized that printer connectivity and management can reduce ownership costs in network printing.

Flash in the RAM

The 300X also has 2M bytes of flash memory for software upgrades. With the JetAdmin software, IT personnel can remotely discover, configure and manage printers on their network.

The 300X works with a variety of operating systems, including Windows, OS/2 and Unix.

The JetDirect 300X costs \$299 and will begin shipping on Feb. 1. Web JetAdmin 3.0 is available now and can be downloaded off the www.hp.com/go/webjetadmin site.

© HP: (800) 430-9442



Did I mention you need to plan?

A ccording to a report issued last week by International Data Corp., 10% of the new operating systems sold in

1997 were either DOS or DOS with Windows 3.1X. That's more than seven million copies of DOS! It's also a half million

more copies of DOS than Windows NT workstation!

A number of people, it appears, are waiting for Windows 98 or NT 5 workstation before upgrading. That's not a good idea. Windows 98 gives you nothing that's not available to you right now, today, in Windows 95. NT 5 may not be ready for you to roll out until mid-1999, while NT 4

workstation is a solid, robust operating system you can use today.

Another reason given is that corporations are forestalling rewriting Windows 3.1 code for Windows 95 because of a lack of time and money. But 99% of Windows 3.1 applications will run — unchanged — on Windows 95. True, they won't take advantage of Windows 95, but they won't suffer either.

A third reason given is that companies are concentrating on Year 2000 problems, spending their money on consultants and programmers to correct deficiencies in their current applications.

So as I understand it, people can't afford to upgrade applications to Win95/WinNT because they're spending too much money finding and correcting Year 2000 problems in these old applications. See the catch? If you're rewriting in-house applications for Year 2000, why not rewrite them as 32-bit Win95/WinNT apps at the same time?

If the problem is third-party applications, upgrade to the latest Win95/WinNT versions — and correct the Year 2000 problems at the same time. If there aren't 32-bit versions, start looking for new vendors.

What's the real **Dave Kearns** problem? People haven't been planning. You've known about the Year 2000 problem for years. You've been told (repeatedly) that Windows NT workstation is your best choice as a general purpose desktop operating system for business. You've known about Windows 95 for three years and have had plenty of opportunity to switch to it as a transition to Windows NT workstation. Yet, people who should know better are buying outdated operating systems so they can continue to run outdated applications, and they're spending big money adding Year 2000 fixes to them.

Hindsight is 20/20, says the old cliché, but foresight is a lot less expensive.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

If you've had the foresight to move to Windows 95 or NT workstation, there's a new tool available to centrally manage large numbers of Windows 95 and NT Registries. IntraSoft, Inc.'s KeyVision server/agent tool will provide — for the first time — centralized monitoring, management and administration of as many as 500 Windows 95 and NT Registries from one server. It does this by keeping all registry entries in an Open Database Connectivity-compliant database, making them accessible to the administrator through one interface. Find out more at the Web site www.keyvision.com/.

1998 Seminar Tour

2/23	San Francisco, CA
2/24	Newport Beach, CA
3/11	Boston, MA
3/12	New York, NY
3/24	Chicago, IL
3/25	Washington, DC
4/7	Atlanta, GA
4/8	Dallas, TX



Presenter
Beth Gage
TeleChoice, Inc.

Seminar Overview

DSL has fast captured the networking community's interest as a possible solution to the throughput bottlenecks that plague today's access networks. DSL holds tremendous potential for providing high speed network access but like any new technology, there are potential pitfalls. There is also a strong business case for DSL in certain environments. The key is knowing when and what type of DSL to deploy to meet your networking requirements and how this emerging family of technologies fits into your present remote access strategy.

High Speed Remote Access Solutions with xDSL will assist service providers, network managers, system integrators and end users in the assessment of this revolutionary new broadband access technology. This one-day seminar is taught by leading DSL consultant Beth Gage of TeleChoice, Inc. The seminar will provide a thorough analysis of the emerging DSL technologies and how they will compare to tried and true remote access solutions like ISDN and analog-dial up.

In addition you will learn the difference between each of the xDSL offerings, which applications they support and when they may be available in various service areas. Find out how xDSL differs from today's remote access service offerings and which xDSL-enabled services will be offered first and from whom.

High Speed Remote Access Solutions with xDSL will provide you with the facts necessary to evaluate DSL and make informed decisions on integrating it into your network without jeopardizing investments in existing remote access equipment and services.

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High Speed Remote Access Solutions

with
xDSL

12 Key Benefits of Attending ...

1. Learn the xDSL basics and how to match the different technologies to new and emerging applications.
2. Understand the differences between DSL and access solutions such as 56k modems, T1, ISDN BRI and PRI, and learn how they will coexist in the marketplace.
3. Analyze the benefits and limitations of using transport technologies such as ATM and Frame Relay with DSL.
4. Explore how xDSL products differ and which to choose for your application.
5. Learn how the DSL market is going to grow globally and at what rate.
6. Look at the business case for xDSL: which service offerings provide the best bandwidth for the buck and when does it make sense to migrate from traditional services to xDSL.
7. Review service offerings that are available today and learn how network managers are using xDSL to meet their company needs.
8. Understand how DSL affects the Customer Premises — what are special wiring requirements, CPE functionality and form factors.
9. Learn the steps for deployment, how to contact a service provider(s), negotiate service contracts and if service level agreements are available.
10. Review the top 10 questions to ask a service provider about xDSL services.
11. Explore what new and future product enhancements will further the case for DSL.
12. Discover what drivers may ensure DSL's success and what potential deployment obstacles may slow its advent.

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Briefs

■ **IBM** last week shook up some of its **top management** after the head of its Global Services Division, Dennie Welsh, took a medical leave of absence.



Sam Palmisano, who ran the Personal Systems group that includes PCs and network computers, will take over for Welsh. David Thomas of the Global Industries group will replace Palmisano. Linda Sanford, head of the System 390/Division, succeeds Thomas. David Carlucci, CIO and vice president of business transformation for IBM, will step into Sanford's shoes. IBM will name Carlucci's replacement later this month.

■ **Compuware Corp.** last week announced that its **EcoTools application management** software now supports Sun Microsystems, Inc.'s Ultra workstation line. Support for Ultra workstations will allow EcoTools users to gauge the performance of applications that run on the Sun workstations.

Compuware also said EcoTools now offers management of Lotus Development Corp.'s Lotus Notes, SAP R/3, PeopleSoft, Inc. and Oracle Corp. applications. Customized EcoTools agents monitor the health and availability of servers and databases running the applications.

© Compuware: (810) 737-7300

■ **Callisto Software** this week will announce the latest version of its **Orbiter** software for managing mobile users. **Orbiter 1.1** can analyze changes to remote clients, run virus scans and optimize disks in the background when the remote user dials in to the corporate site to collect e-mail. Orbiter runs on Windows NT servers and Windows 95 clients. The server costs \$5,000, and clients range from \$3,750 for 25 to \$100,000 for 1,000.

© Callisto: (630) 682-8200

Ariel can slip 24 modems onto a single PCI card

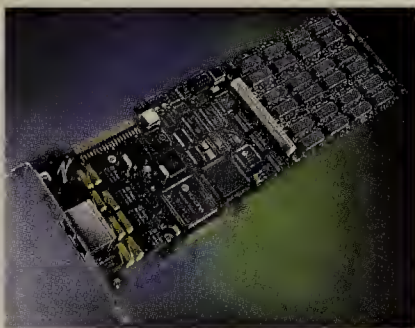
New modem card hardware converts NT servers into remote access servers in about 15 minutes.

By Tim Greene
Cranbury, N.J.

Ariel Corp. has made it easier to support dial-up remote access in Windows NT server-based networks.

Next week at the ComNet '98 conference in Washington, D.C., Ariel will introduce the newest version of its PCI modem cards, RASCAL 2000, which squeezes 24 modems onto a single PC server board.

A PC server running Microsoft Corp.'s NT Remote Access Services can be upgraded with the card to send and receive 56K bit/sec modem or ISDN calls, eliminating the need for stand-alone modem banks or more expensive dedicated remote access boxes.



The RASCAL 2000 single PCI card from Ariel contains 24 56K bit/sec modems.

The device can be installed in about 45 minutes by someone with moderate knowledge of phone systems, according to Chick Green, MIS manager for GT Development Corp., a truck parts manufacturer in Seattle. He uses Ariel's two-card predecessor to the RASCAL 2000.

RASCAL 2000 contains a line-termination unit (for terminating calls from a T-1 or Primary Rate Interface ISDN line), an ISDN controller and 24 modems.

RASCAL 2000 does in one slot what its predecessor, RASCAL 1000, took two slots to do. Since last fall, when Ariel introduced RASCAL 1000, modems and line-termination interfaces have been made smaller.

The Power PC processor supplies most of the processing power the card needs. The

rest is supplied by tapping about 2% of the host-server CPU power.

The card can be installed in 15 minutes by a network engineer already familiar with NT who has the technical knowledge to install an Ethernet card, claimed Stephen Curtin, Ariel's marketing manager.

RASCAL 2000 requires a server running NT RAS 4.0 or higher with at least a 90-MHz Pentium processor, a PCI slot, 48M bytes of RAM and support

for a T-1 line. Server Pack 3.0 also is recommended.

The server also must have dual fans to handle heat from the card. The company said a typical server that already has such a fan can support at least two of the cards without overheating.

RASCAL 2000 administration is not as fully featured as that available on chassis-based remote access servers from other vendors such as 3Com Corp., Ariel Chairman and CEO

Anthony Agnello said. But Ariel is working on beefing up those offerings for a future release, Agnello said. Most of the administration features rely on NT RAS administrative capabilities.

RASCAL administration software lets users dial in to monitor, reset or bring up modems on a card. Each modem can be set for dial in, dial out or both.

Now in beta test, RASCAL 2000 ships next month, and is priced at about \$11,000.

© Ariel: (609) 860-2900



Big Blue: Master of networking patent domain

By Marc Songini
Armonk, N.Y.

IBM's research and development efforts may yet restore it to the leadership role in networking that it enjoyed in its heyday.

Last year, IBM made major breakthroughs in copper chip and storage disk technology and filed for 700 patents for network-related technology, said Marshall Phelps Jr., vice president of intellectual property and licensing at IBM.

Some observers had feared that a billion-dollar cutback last year in Big Blue's research and development budget would lead to technology stagnation and less innovation.

For the past half decade, IBM has held the top spot for the volume of patents granted. In 1997, Big Blue had 300 more technology breakthroughs than other networking companies. NEC came in second with 1,095.

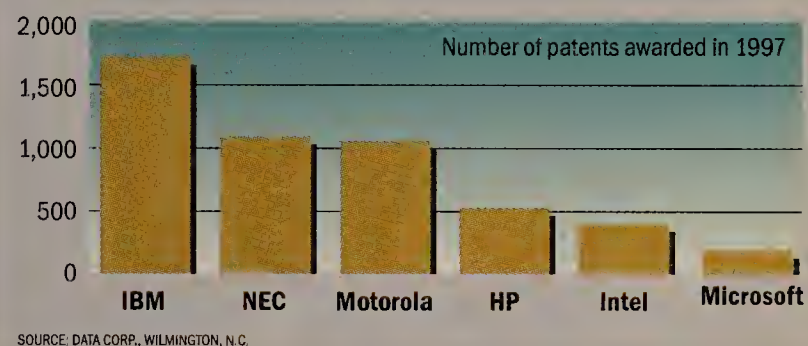
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IBM: FIRST IN PATENTS

Here's how a few network companies fared in the patent race last year.



Despite this, the number of patents granted in 1997 was down to 1,724 from 1,867 in 1996. However, Phelps said, that was not the fault of IBM but of the U.S. Patent and Trademark Office, which experienced a slowdown in 1997.

IBM believes greater energy should go into its network R&D effort, especially as it relates to the Internet, Phelps said. This reflects a companywide thrust to make IBM the premier Web corporation.

Special rewards were given to researchers who won patents in the areas of Java, high-speed networking, security, mobile agent and collaborative computing technologies.

Among the patents granted was one for "Immune System for Cyberspace," a technology that detects and eliminates viruses —

known and unknown — in minutes.

Two patents transform text-based messages, such as e-mail, into sound via radio waves. This allows mobile network users to remotely listen to business data in places such as their cars or homes.

Another new technology IBM is developing lets a Web server monitor how many hits it receives and, based on that information, provide greater support to the most popular Web pages.

The majority of the patent filings (500) came from IBM's Microelectronics Division, which produces chips, placing it on par with Intel Corp. in the semiconductor field, IBM claimed. IBM's Research Division follows its Microelectronics Division in the number of patents acquired. ■

Next-generation router architectures

New ways of routing the Internet

By Jim Duffy

S

everal router start-ups are proposing different ways to combat the same problem: Internet scalability.

With traffic on the Internet doubling every six months, all of the start-ups agree that a new generation of gigabit and terabit routers is required. Yet they differ on the best architectural approaches to achieve gigabit and terabit rates.

Analysts say the different approaches reflect engineering preference rather than proven advantage over other designs.

"They're coming at it from different angles depending on their backgrounds," says Brendan Hanigan, an analyst at Forrester Research, Inc., in Cambridge, Mass. "It's just another way of cracking the same nut."

Avici Systems, Inc. is pitching a terabit router with a switch fabric that models the growth of the Internet. Avici's Terabit Switch Router (TSR) is designed to scale from 600M bit/sec to multiple terabit/sec to accommodate the geometric growth of the 'Net.

"Scalability is our biggest differentiator," says Avici President Surya Panditi.

True, TSR, like other next-generation routers, will use hardware-based routing, forwarding, multicasting and quality of service to maintain gigabit line rates. But where TSR differs from its brethren is in the line cards.

Each TSR line card sports a so-called Direct Connect Fabric (DCF) that serves as a 70G bit/sec router. Twenty of these line cards will fit into a rack-mountable, dual-shelf TSR chassis with a passive backplane.

With DCF, each line card adds 60G bit/sec of switching capacity to TSR. In a fully loaded dual-shelf, TSR will have up to 1.4 terabit/sec of switching capacity. Internet service providers can scale beyond that by adding more TSR shelves and line cards to their equipment racks.

Another player in the terabit router game is Pluris, Inc. Pluris is proposing massively parallel processing to solve the Internet scalability problem.

The Pluris Massively Parallel Router (MPR) is a collection of single-board computers, or processing nodes, attached via a proprietary data interconnect.

Each MPR processing node has enough memory and processing power to route IP packets at OC-12, or 622M bit/sec speeds, says Vadim Antonov, chief technology officer and vice president of engineering at Pluris.

One or more dedicated processing nodes are used for processing routing protocols. Every processing node has a copy of the forwarding table.

The data interconnect is a patent-pending "self-healing" butterfly switch based on multiple multigigabit serial communication lines. Pluris chose a butterfly switch to achieve linear scalability, Antonov says. "Crossbar switches are great for telephony because you have long-lived connections. If you try to use crossbar switches for packets you soon discover that scaling the crossbar kills you," he says.

Pluris will prototype MPR in February and release it in the second half of this year, Antonov says.

Neo Networks, Inc. is another proponent of massively parallel routing. Neo claims that other archi-

While one processor handles application and protocol processing for the data stream, another performs look-up, queuing and prioritization for that stream. This massively parallel architecture yields forwarding performance of more than 400 million frame/sec, Neo claims.

One start-up that does not see the need to move to massively parallel routing is Torrent Networking Technologies Corp. Torrent believes that a shared memory switch fabric, coupled with ASICs and a fast route look-up algorithm, suffices.

Torrent's IP9000 router is composed of three elements: the shared memory switch fabric, embodied in eight- and 16-slot chassis; forwarding engines, which are 10/100 Ethernet, Gigabit Ethernet and

ATM modules with route look-up and packet classification ASICs on each port; and a route processor, a stack-on general purpose computer for routing table maintenance and system configuration.

IP9000 is designed to maintain a fast path for all IP traffic by taking the route processor out of the forwarding path. The route processor uses a private channel through the switch fabric to update tables on forwarding engines and only issues updates when changes occur.

Maintaining an entire routing table on each IP9000 port instead of caching known routes helps eliminate the slow path altogether, Torrent claims. A full table search is performed for every packet at wire speed. This avoids the non-deterministic performance of cache-based searches and associat-

ed uncertainty in packet latency, according to Torrent.

The search results include the output port, next-hop router address and also any stored service profiles to be applied to the packet. With the information obtained from the routing table search, per-port silicon is able to make all the necessary packet modifications, including queuing and priority information, before presenting the packet to the switch fabric for processing.

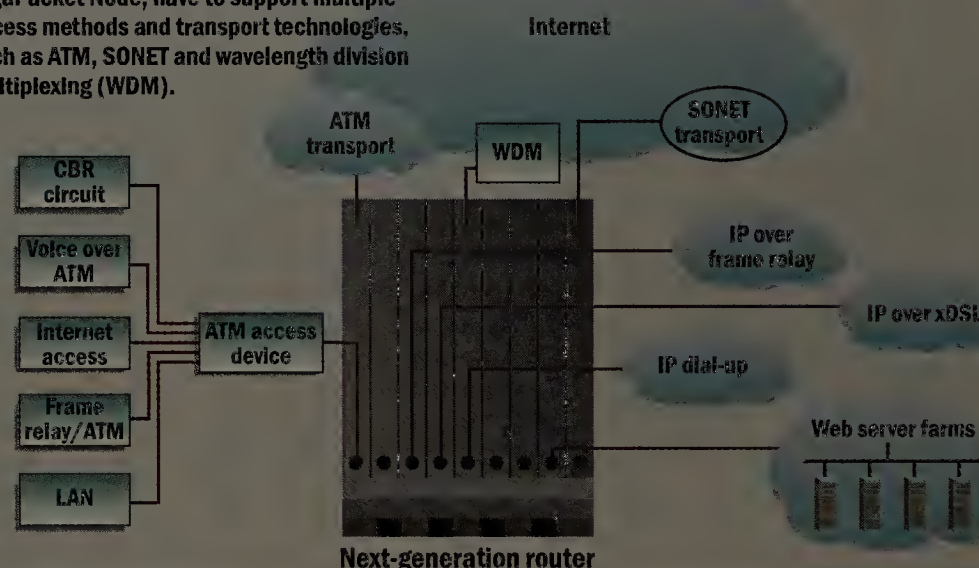
This helps the IP9000 scale routing to tens of millions of packet/sec, Torrent claims.

Argon Networks, Inc.'s GigaPacket Node router will have a 150G bit/sec ATM switch at its core, port-level route look-up and support for heterogeneous network and data link protocols.

Nexabit Networks is working on a router with a 2.5T bit/sec fabric and 32 OC-48 interfaces. The router will enter beta trials in June, says Gene Wahlberg, senior vice president of sales and marketing at Nexabit. ■

AN INTEGRATED SERVICE PLATFORM

Next-generation routers, such as Argon's GigaPacket Node, have to support multiple access methods and transport technologies, such as ATM, SONET and wavelength division multiplexing (WDM).



tectures that employ fast switching fabrics with modular or separate route processors can become bottlenecks by forcing packets to take multiple trips through the switch fabric. They also can leave networks unprotected, says Mark Cree, Neo's vice president of marketing.

StreamProcessor 2400, which ships in the second quarter of this year, is a 16-slot chassis that sports a 512G bit/sec modified crossbar fabric, seven custom Application Specific Integrated Circuits (ASIC) and more than 1,000 Reduced Instruction Set Computing (RISC) processors. The 16 slots can hold four- and eight-port Gigabit Ethernet modules and a four-port, 2.5G bit/sec OC-48 card.

Multiple chassis can be linked to reach terabit rates, Cree says.

The StreamProcessor views incoming packets as a stream of bits that become an instruction set for the massively parallel architecture. Incoming data is parsed and directed to the RISC processors for application and protocol processing.

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Briefs

■ **Sprint Corp.** last week sold back the 49% stake it had taken in 1993 in the French company **Alcatel Alsthom's Data Networks** unit. The price was not disclosed. Sprint uses Alcatel switches heavily in its frame relay and ATM networks, though Sprint's new frame relay offerings with latency guarantees based on traffic priority run over Northern Telecom, Inc. switches (NW, Aug. 4, 1997, page 6).

■ **The Federal Communications Commission** extended to Feb. 26 the deadline for **personal communications services (PCS) C block** wireless licensees to notify the FCC about their payment options. The original deadline was Jan. 15. The C block licensees have three options: continuing with their installment payment plan, returning half of their spectrum licenses with half of their debt forgiven or returning all licenses with all C block debt forgiven (but any money collected before March 31, 1997 by the FCC will not be returned). The FCC also announced that it will reacquire all defaulted or returned C block licenses on Sept. 29.

■ **AT&T** suffered a nationwide 5 1/2-hour outage in Canada on Friday, Jan. 9. The outage lasted from about 11:30 a.m. to about 5 p.m. EDT. A spokesman said the company is still investigating the cause. AT&T Canada, which competes with Bell Canada in Ontario and Quebec and dominant provincial carriers elsewhere, has a coast-to-coast fiber-optic network supplemented by digital microwave facilities. So far, however, it has brought up only one of four planned Synchronous Optical Network (SONET) self-healing rings.



MCI to offer Visual view of frame relay nets

By David Rohde
Rockville, Md.

MCI Communications Corp. has selected Visual Networks, Inc.'s Visual UpTime as its primary circuit monitoring and analysis system for its managed WAN services customers.

The move opens the door for expanded frame relay service-level agreements (SLA) by giving MCI an end-to-end measurement of user traffic and network performance.

Visual UpTime collects data on circuit availability and performance via proprietary digital service unit/channel service units placed on all of the customer's premise locations. Using the system, MCI engineers at its managed-services network operations center (NOC), in Cary, N.C., can gain better statistics not only on the MCI frame relay cloud but also on all of a user's

dedicated access lines from local carriers.

As a result, MCI will be able to craft end-to-end SLAs instead of the typical WAN services guarantees covering only the long-distance portion of the network. In addition, Visual UpTime's ability to determine whether problems are originating from the local access line, the carrier switch or the long-distance network should help MCI fix problems

faster for its managed-services customers, said Teri Langley, manager of MCI WAN Managed Services, in Richardson, Texas.

MCI is not the first big carrier to throw in its SLA lot with Visual Networks. In 1996, Sprint Corp. began reselling Visual's DSU/CSU, known as the Analysis Service Element (ASE), to its frame relay customers. Sprint customers pay monthly for each ASE unit plus a database server and

management console that stores the circuit data. Other carriers and vendors also have jumped aboard Visual's bandwagon (see graphic).

In contrast to the Sprint deal, the hardware and software for Visual UpTime will be included as part of MCI's managed WAN services and the management console located at the MCINOC.

"At the end of the day, the customer doesn't want yet another server," said Peter Luff, marketing manager for carrier programs at Visual Networks, based here.

In another difference from Sprint, MCI initially will offer Visual UpTime only to those who purchase a management contract along with frame relay transport. Managed frame relay deals involve an additional monthly per-site fee, typically on the order of several hundred dollars, in exchange for router or FRAD configuration, installation and monitoring.

MCI's standard tariffed frame relay service currently offers data delivery and latency guarantees only from switch to switch within the MCI cloud. New managed-services customers soon should receive end-to-end SLA extensions as a standard benefit, MCI officials said. During the second quarter, MCI plans to offer credits for existing managed frame relay users to retrofit their networks to take advantage of Visual UpTime, said Chris VanLuling, director of MCI WAN Managed Services. A broad offering to nonmanaged frame relay customers, akin to Sprint's arrangement, is under consideration.

© MCI WAN Managed Services: (972) 498-1434; Visual Net-

A little help from their friends

Visual UpTime enjoys benefits from a growing stable of partnerships:

Partner	Benefit
Bay Networks	Included in Optivity network management family
BellSouth	Jointly marketed to frame relay customers
IBM	Field support provided
MCI	Included within managed WAN services
Sprint	Resold by carrier with joint monitoring

Easing the telework headache

US WEST and Deloitte team to offer mgmt. help.

By Tim Greene
Denver

US WEST, Inc. and Deloitte Consulting have teamed up to help large corporations set up teleworking programs.

Often, the job of setting up a telework program falls to the IS department, but it involves more than what IS is trained to do, according to Jeff Freeth, transmission manager for Hewlett-Packard Co. He was in charge of setting up an ISDN-based telecommuting network.

"Some jobs do not lend themselves to full-time telecommuting, and that [decision] should be something between the worker and their manager," Freeth said.

Because those management decisions were beyond his scope, they were shunted back to be

handled separately by the direct supervisors of the telecommuters, Freeth said.

The joint US WEST-Deloitte offering will coordinate management and technical ends of telework programs, with the aim of a smooth phase-in followed by orderly growth.

One-stop teleworking

US WEST and Deloitte Consulting have teamed up to provide Telework and Mobility Solutions.

What US WEST brings:

Software, hardware, transport, service and support of network.

What Deloitte brings:

Knowledge of organizational change, ability to set productivity benchmarks for teleworkers and expertise in individual industry sectors.

Together, US WEST and Deloitte will offer a package called Telework and Mobility Solutions in which US WEST will provide advice on hardware, software and transmission lines, and Deloitte will consult on how to manage workers whose homes have become their offices.

US WEST said it sees customers try telecommuting programs but never get past the stage of a 50-user beta program because too many management problems arise unexpectedly. That type of experience causes companies to pull back from their original plans to expand the programs or scrap them altogether, US WEST said.

With the service, Deloitte will provide consulting on change leadership, value-based management, re-engineering and other management issues.

They can answer questions such as how to manage people in disparate locations and maintain some semblance of a corporate culture.

US WEST will provide customer-site voice, data and video hardware, analog or digital wide-area links, installation, continuing support and consolidated billing.

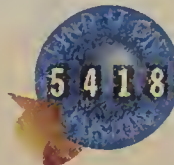
Telework and Mobility Solutions are available to beta customers now, with general availability due at an unspecified later date.

Pricing for the service is on an individual case basis.

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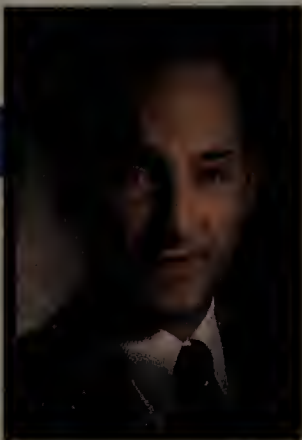


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William Maro

President and CEO
NextPoint Networks

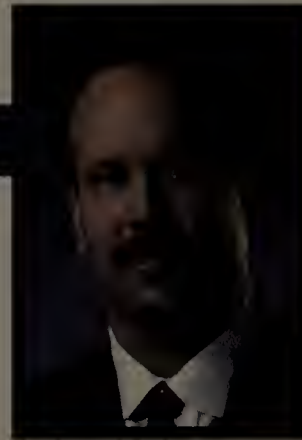
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Rick Hamada

SVP Systems Business Unit
Avnet Computer

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Led by President and CEO Don Reed, Cabletron Systems is a world-renowned developer, manufacturer and marketer of standards-based LAN, WAN and ATM networking solutions. Through its advanced switching and enterprise management products, coupled with strategic industry partnerships, Cabletron provides the infrastructure to seamlessly support voice, video and data resources from one integrated platform. The result: simple, reliable, cost-effective solutions for a better way to work.



WAN MONITOR

The SS7-ization of the Internet

Leave it to the little guys to do what's important in the market.

Little-known competitive local exchange carrier XCOM Technologies, Inc., which humorously dubs itself "the data phone company," has come up with a way to bypass heavily burdened central office switches when data traffic is involved.

XCOM's first client, Ascend, is probably one of many that is going to start using the smarts of the voice network to figure out what the heck to do with all the data traffic that is blowing through the central office.

The XCOM platform separates data from normal voice traffic using features and intelligence in the public switched telephone network (PSTN), such as Signaling System 7 (SS7) and proprietary software developed by XCOM. Acting like a traffic cop, XCOM's box identifies and directs incoming data straight to a terminal server, bypassing the voice switch entirely.

The result? Data is off-loaded from the congested PSTN, enabling better connectivity and true integration of data and voice traffic.

What will make hot technologies such as virtual private networks hum, and bring IP telephony folk into the mainstream, is the interface of the IP layers with the smarts of existing SS7 databases, to do the things that make sense to all of us.

Recall that it is SS7 and centralized databases that allow you to do geographic and time-based routing of phone calls. If your New York office were closed, then all calls would be routed to your California office, which would still be open. The same would be true of IP-based telephony calls. The need for similar routing is clearly there.

When MCI launched its Vault capability last year, if you squinted at the architecture schematics, you could see dotted lines from the IP switching layer to the SS7 data access points in the MCI architecture.

This was really the first public play for serious integration of data networking with voice networking because it was being done on more than just a trans-

As you see telcos such as GTE preparing to do battle with extensive nationwide IP networks, a critical piece has to be SS7 integration.

Still, achieving SS7 and data network integration won't be a trivial task. For

example, data networks, and the Internet in particular, handle calls in fundamentally different ways. There are a lot of neat features that carriers have developed over

time, such as routing by area code, that will be tough to carry over to the data environment.

But then there are features that reside in the data network that should work easily in an SS7-data network environment. For example, look-ahead routing, which scouts forward in the network for congestion and busy signals, should work well.

After all, SS7 is a packet network that talks to all the switches and other network adjunct devices.

Briere is president and Heckart is vice president with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.



Daniel Briere and Christine Heckart



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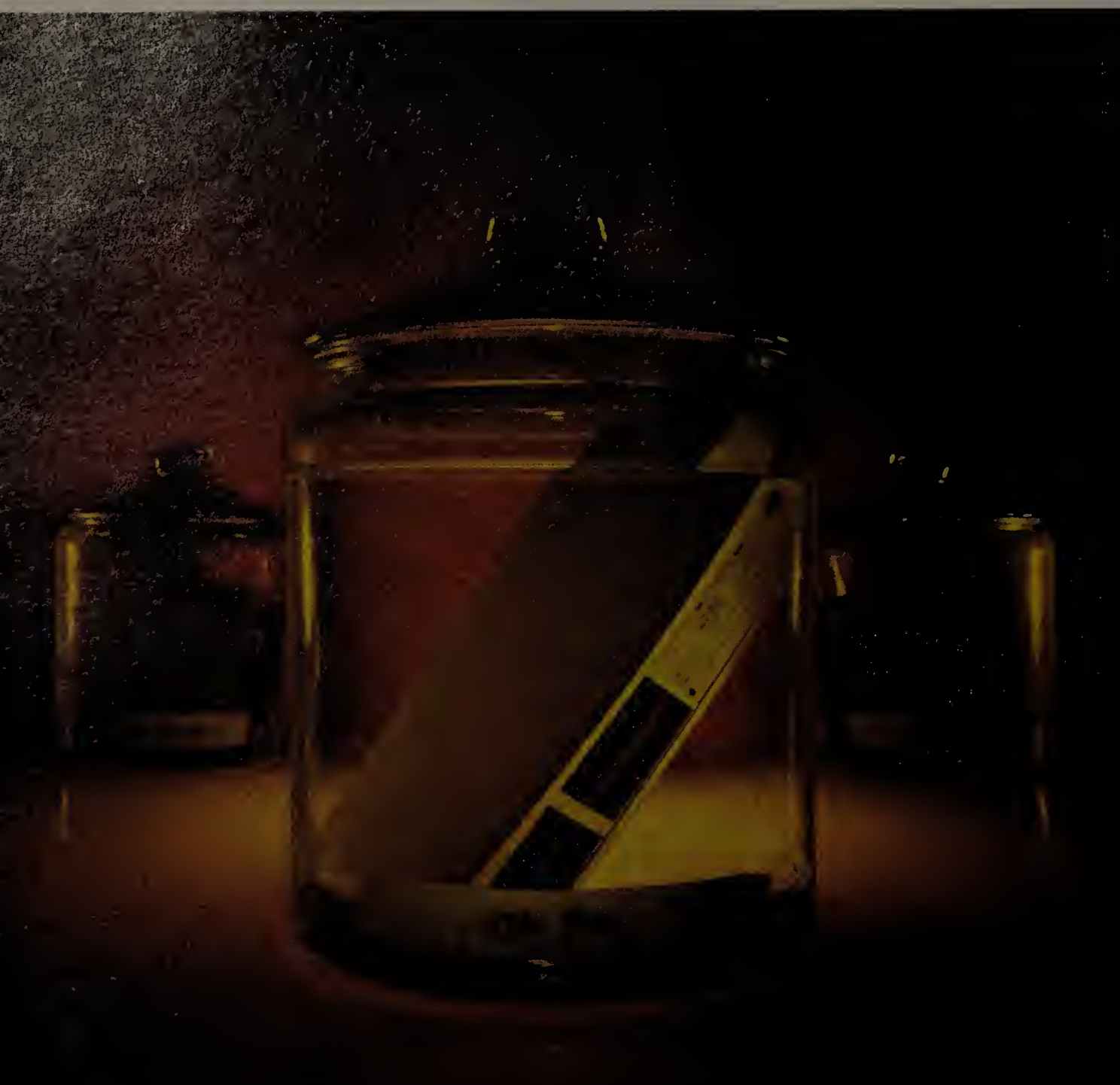
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Briefs

■ **Robert Moskowitz**, the Chrysler Corp. technical support specialist who has played a key role in promoting the IP Security (IPSec) stan-



Moskowitz takes on a new challenge.

dard, last week announced he has joined the International Computer Security Association (ICSA) as a senior technical director. Moskowitz will direct the organization's IPSec product and system certification process. The Detroit-based Automotive Industry Action Group, which sets network standards used in the automotive industry, has asked the ICSA to manage IPSec certification testing to ensure product interoperability.

■ **Micro Computer Systems, Inc. (MCS)**, of Irving, Texas, last week released Calypso 2.4, an upgrade to the company's e-mail client software. The new version adds spam control capabilities, support for the Lightweight Directory Access Protocol and a feature that allows pager notification of received messages.

Calypso costs \$39.95 for one copy and \$169.95 for a five-user license.

© MCS: (972) 659-1514

■ **Web content aggregator Yahoo, Inc.** has struck a partnership with **MCI Telecommunications Corp.** to launch an exclusive online service and information package to compete with America Online.

Yahoo Online is slated to debut by April, with MCI providing the network backbone. Subscribers will be given a customized home page and links to existing Yahoo services, including personal finance portfolios and news. Pricing for Yahoo Online was not announced.

© MCI: (800) 550-0927

IBM foresees bigger role for Web agent software

By Marc Songini
San Jose, Calif.

IBM is looking to give its low profile Web-based intelligent agent software an enterprise boost this year.

Until now, the company's Web Browser Intelligence (WBI) software, which runs alongside a Web browser, has been used primarily to help individual users conduct more productive Web searches. WBI acts as an intermediary between the browser and

Web servers, tracking usage patterns, suggesting shortcuts and checking selected Web sites for changes.

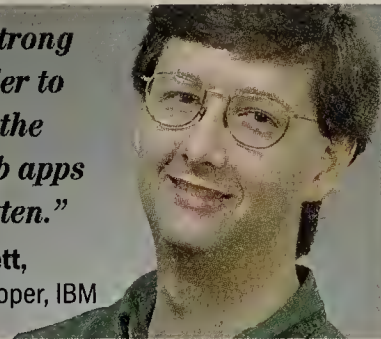
But Big Blue researchers envision a wider role for the software, which they said could help network administrators better handle security and management of corporate intranets.

WBI, pronounced "webby," works with any

browser and runs on Windows 95, Windows NT and OS/2 workstations. IBM is expected

"It's a strong contender to replace the way Web apps are written."

Rob Barrett,
WBI developer, IBM



to announce WBI support for other platforms in the future. While IBM has no new WBI-based products slated for announcement, the company said it is working on customized applications for at least one large customer.

Rob Barrett, a software developer at IBM's Almaden Research Center here, and the "father" of WBI, said there is a host of things WBI can or will be able to do to solve IS managers' headaches. "I could show IS managers how to address two-thirds of their problems using WBI technology," he said.

WBI could be used to help enhance enterprise network security, Barrett said. Today, most end users are forced to log on to various servers using different passwords to access multiple network resources. WBI could allow customers to build applications for enabling end users to log on once and gain access to multiple servers, Barrett said.

However, it is not clear how this technology would fit with IBM's existing single sign-on products.

WBI also can be used to convert document formats on the fly, Barrett said. The technology can, for instance, turn TIF files into GIF files automatically.

Another potential use for WBI would be to keep track of Web transaction patterns for electronic commerce applications.

Users can try out IBM's technology by purchasing the WBI Development Toolkit, which is available now. Price is negotiable.

© IBM: (607) 752-6024

Start-up makes electronic storefront security push

By Ellen Messmer
San Francisco

Start-up Transactor Networks, Inc. last week announced Transactor, a Java-based client/server tool kit that lets online merchants build more secure electronic storefronts.

Transactor software supports digital certificates to authenticate transactions and identify shoppers. By using Java, merchants also can create lively multimedia animations to display products.

Transactor works by requiring each shopper to register once and get a unique ID from the Transactor server. Once that process is complete, a Transactor client is downloaded to the user's machine, said Ron Martinez, CEO at Transactor Networks, which introduced its software at the RSA Data Security Conference here.

With the Transactor client, the shopper gets a digital certificate that authenticates his identity when making a purchase. Transactor makes it possible to charge for goods using a variety of payment methods, such as credit card, when the user clicks on the object. The company claims the digital certificates make security in Transactor-based transactions strong.

"It's not hacker-proof — that's impossible," acknowledged Bruce Schneier, Transactor Networks' chief technology officer. But Schneier said the

security he has designed into Transactor is going to make it too time-consuming and expensive for hackers to spend that much effort to bring it down.

In addition to the security, Transactor should enable buyers to get a better handle on what they are purchasing. For example, if buyers click on an item for sale, which is written as a digital object, they can see Java-based interactive previews and demonstrations in a way not possible with more static HTML and GIF files, Martinez said.

"The next generation of shoppers is going to want to be entertained while they're shopping, and Transactor can deliver that through Java-based interactive animation," Schneier said.

Martinez said music and online game distributors have shown the most interest in Transactor's system so far.

Pricing on Transactor, which goes into beta in February, has not been set.

© Transactor Networks: (415) 487-1100

A security sampler

Transactor wasn't the only company making noise at the RSA Data Security Conference last week. Here's a summary of other announcements:

Vendor	Announcement
Entrust Technologies	Secure Enterprise Desktop, S/MIME-based software that works with Netscape and Microsoft browsers as well as several e-mail packages to encrypt and sign desktop applications.
VPNet Technologies	Support for IPSec ISAKMP/Oakley encryption on the VPN Service Unit. Also, the unit will be upgraded to support 600 simultaneous remote users.
Finjan	Surfin Suite, software that lets companies block or inspect ActiveX and Java applets at desktops throughout the enterprise. Information about the applets can be collected at a central console.
CertCo	CertAuthority, an X.509 certificate generation and management product designed primarily for financial institutions.
Rainbow Technologies	Support for the Secure Electronic Transactions (SET) credit card processing protocol on the company's CryptoSwift device for speeding up encryption processing.

Get more online:

- Downloadable copies of a WBI client and SDK
- Agent FAQs and project links
- A look at the use of agents in telecommunications and electronic commerce



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NET INSIDER

Pity the poor telco

What's a poor PTT to do? The world from the post, telegraph and telephone administration's (a.k.a. government-owned telecommuni-

cations monopoly) point of view is undergoing a lightning fast change. Used to no competition and decade-long planning cycles, many of the world's PTTs on Jan. 1

were suddenly put in the position of having to earn their customers rather than have them captive and beholden by the right and might of the law.

The change is a result of the World Trade Organization's (www.wto.org) General Agreement on Trade in Service. This agreement opened almost all telecommunications markets to competition at

the start of this year . . . well, at least in theory.

Some of the competition may take a while to develop (sort of like the instant competition that showed up in the U.S. local telephone market after the passage of the Telecommunications Act of 1996). But not all of the PTTs can be complacent and lethargic in their response to the rules changes.

For example, with three companies competing for international phone business, Israel now has some of the lowest international calling rates in the world. The rates are even lower than those in the U.S. This must have been quite a shock to the old guard monopoly.

The German PTT, Deutsche Telekom (DT) (www.dtag.de), also is an interesting case study. DT is the largest telecommunications provider in Europe and the third largest in the world, at least according to the carrier. DT is responding to the rules changes in a number of ways, some positive and some not.

The carrier has been cutting employees, down 15% from 1993, following a "socially conscious workforce reduction programme." DT has been making significant price reductions in its services, including a 45% rate cut for calls to **Scott Bradner** North America.

DT has service offerings in a number of nontelephone areas, including cable TV and Internet connectivity. As we are seeing in the U.S., it does not hurt to be big in the telecommunications business and DT is big.

DT even formed its own venture capital subsidiary known as T-Venture (www.t-venture.de) to invest in high-tech telecommunications and information technology companies.

The carrier also is a significant investor in the IP telephony company VocalTec Communications, Ltd. (www.vocaltec.com/) just in case this Internet thing starts to have an impact on normal telephone usage.

At the same time, DT has proposed to charge its customers a "processing fee" of as much as \$52 if they want to switch to another telephone service provider. This does not make DT's competitors all that happy, and the German government may still force the fee to be lower. Yes, there is still some place for government control in this age of competition.

Unfortunately, DT's ability to react to the emerging competitive world is the exception and not the rule. Just take a look at the U.S. regional telephone companies for an alternative approach.

Disclaimer: The change process at Harvard is "deliberate," thus the above support for change is my own opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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However, if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and operating systems.

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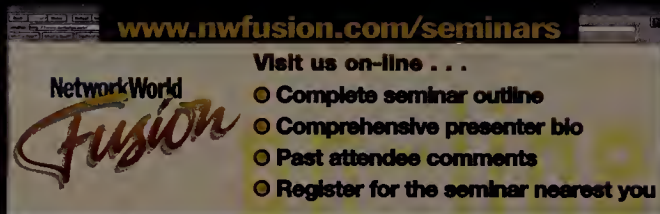
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Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to rnutter@world.std.com.

I am having problems seeing NT server software I recently installed on a Compaq Computer Corp. Prosignia 200 with 64M bytes of RAM. I've had the firm that installed the cable recheck it and, since this is my first experience with NT, I've reinstalled the software to make sure I didn't make a mistake there. Neither of the checks turned up any problems. Do you have any suggestions?
Via the Internet

First, try putting the network card in a different slot. It's possible that the card isn't connecting properly to the slot in your particular system. Or, you could try the old trick of rubbing a pencil eraser across the network card's contacts to remove oxidation.

If these don't work, run Compaq's built-in diagnostics. You should be able to reach these by pressing F10 when the block cursor appears in the upper right-hand corner of your screen or by booting the server from Compaq's SmartStart CD and going to the diagnostics from there. Use the Test option to verify that the network card is responding properly. If the diagnostics don't show any errors, check Compaq's Web site — www.compaq.com — for updated files for the Prosignia you're using.

You'll also want to download and apply the latest Rompaq, a BIOS update, for the server. This BIOS update addresses a whole list of issues, depending on how long you have had your server and how recent the latest Rompaq is. As Compaq service staff will tell you, you should do this periodically to help avoid problems.

The other item you'll need to download from the World Wide Web and check periodically is the latest support software disk (SSD) for the NT version you're running. The SSD includes a hardware abstraction layer and updated drivers for the SCSI and network controller in your system.

You also could try using a different patch cable from the server to the hub.

Layer 4 switching could relieve saturated servers

New technology helps load balance heavily used servers, ease access to distributed applications.

By Bert Williams

End-to-end performance and service quality require carefully balancing the capacity of all networked elements to ensure a smooth flow of data between clients and servers.

Layer 2 and Layer 3 switching products have done well in addressing important bandwidth and capacity issues in the LAN and internetwork, but more may be needed. That's where a new technology, Layer 4 switching, could come into play.

Layer 4 switching is the latest approach to extending the performance and traffic management capabilities of Layer 2 and Layer 3 switches to servers and applications.

Layer 4 switching uses information in the Layer 3 and Layer 4 packet headers — such as TCP/User Datagram Protocol (UDP) port numbers, the "SYN/FIN" bits that mark the start and end of application sessions and IP source/destination addresses — to identify traffic sessions by application. Armed with this information, Layer 4 switches can make intelligent decisions regarding where to forward session traffic.

This is particularly useful in large corporate data centers, Internet service providers or content provider sites where multiple heterogeneous systems are used to support one application. The technology also is useful where replication across many physical servers is required.

Demystifying Layer 4 switching

Routers and Layer 3 switches forward individual packets without any idea of what packets came before or after. Layer 4 switching tracks and maintains individual sessions from start to finish. Thus, Layer 4 switches are really "session switches."

While routers make packet forwarding decisions based on link or network node availability and performance, Layer 4 switches make forwarding decisions based on session and application-layer information. Doing

this allows user requests to be switched to the "best" server based on a variety of criteria. As a result, Layer 4 switching is an ideal mechanism for traffic or load balancing across multiple servers.

How it works

A Layer 4-capable switch acts as a "virtual IP" (VIP) front end to the servers connected to it. A VIP address is configured for each server or group of servers that supports a single or common application. The VIP address is advertised and registered with the Domain Name System.

HOW IT WORKS Switching at Layer 4

A Layer 4 switch uses information found in data packet headers to make intelligent decisions about where to send data. This helps speed access to resources in large environments where applications can be spread out over multiple distributed servers.

4 All subsequent packets are remapped and forwarded from the client to the server until the switch sees a session termination packet.

FIN packet.

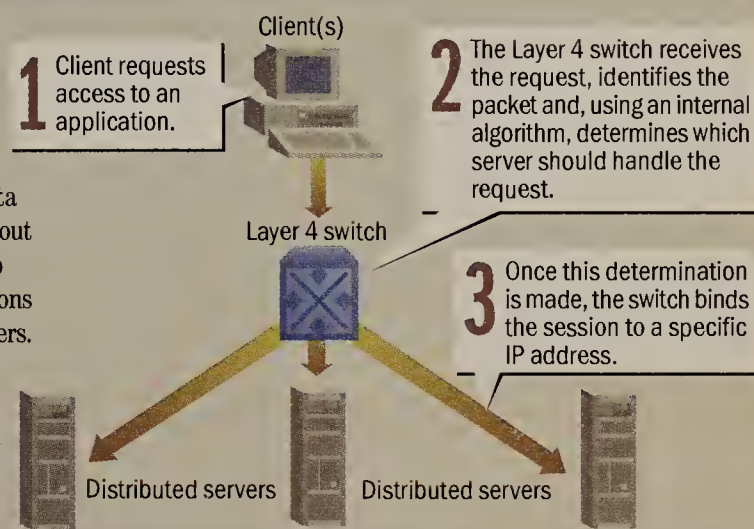
With Layer 4 switching, connections can be bound to real servers to meet customer-specified criteria, such as having an equal number of connections on each server or weighing traffic by the capacities of different servers.

Today's typical single-function load-balancing products can bind 400 to 800 connections per second, per device. However, a new generation of products that combine Layer 2 and Layer 4 functions — using hardware-based, load-balancing capabilities within custom Application Specific Integrated Cir-

CPU utilization, which can be obtained automatically by adapter drivers and Layer 4 switches. Current closed-loop feedback mechanisms require that software agents be deployed in each server.

Layer 4 switches are distinctly different in form and function from dedicated load balancers. Traditional hardware-based load balancers are two-port devices optimized for WAN speeds up to 45M bit/sec. They range in price from \$10,000 to \$35,000.

Layer 4 switches are designed for high-speed intranet applications and support multiple 100M-bit/sec or gigabit inter-



When a service request is made, the Layer 4 switch recognizes the start of a session by identifying the TCP start, or SYN packet. It then uses sophisticated algorithms to determine the best server to handle the request.

Once this determination is made, the switch binds the session to a specific IP address and substitutes the server's real IP address in place of the VIP address on the server.

Each Layer 4 switch maintains a binding table that associates the source IP address and source TCP port to the chosen server.

The Layer 4 switch then forwards the connection request to the server. All subsequent packets are remapped and forwarded between the client and the same server until the switch sees a session termination, or

culits — yield binding rates in excess of 100,000 connections per second.

A key question in all this is how to determine the most available server to which traffic is forwarded.

Today, various methods are used to drive load-balancing decisions. Depending on the desired load-balancing granularity, Layer 4 switches can distribute application sessions to servers using a number of heuristics. These methods include simple weighted round robin to weighted least connection, measured round-trip delay, or closed-loop feedback from the servers themselves.

Closed-loop feedback is the most advanced, taking advantage of specific system information, such as available memory, I/O interrupts and

faces. The cost of the new devices ranges from \$12,000 to \$15,000.

Layer 4 switching allows many other capabilities beyond load balancing such as the ability to control traffic flows based on application type and user ID. Using multistage queuing techniques, Layer 4 switches can designate and prioritize traffic by application.

Additionally, sitting directly in front of servers, Layer 4 switches are equipped with knowledge of application sessions and user permissions, making them an ideal platform for preventing unauthorized access to servers.

Williams is director of market development at Alteon Networks, Inc., a leading proponent of Layer 4 switching. He can be reached at bert@alteon.com.

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More ambitious proposals for IBM's network division

If you're an avid reader of this column (and who isn't?), you'll recall that during the summer I urged IBM to spin off part of its Networking Hardware Division (NHD) with the goal of re-energizing NHD and making it a more powerful player.

My logic went like this: While IBM's NHD brings in plenty of revenue—at least that of 3Com or Cisco—it doesn't have the market muscle or visibility of either of those companies. That's because NHD is serving two masters. It must support its huge base of SNA customers while at the same time competing against the 3Coms and Ciscos of the world in non-SNA—read IP-centric—networking.

By spinning off the SNA products portion of NHD into a separate company—stealing a page from AT&T's spin off of Lucent—IBM could achieve a couple of goals. First, the spin off company would live and breathe SNA networking, offering customers new solutions for bringing mainframes into this intranet world. Second, NHD would be free to focus more intently on IP networking.

Well, IBM CEO Lou Gerstner hasn't taken my advice: NHD stands undivested. Undaunted, however, I will plow ahead in offering recommendations.

If splitting up NHD isn't to IBM's taste, now would be a good time for the company to use some of its ample cash reserves to take advantage of M&A opportunities that would strengthen NHD.

With a market cap of just over \$2 billion (based on a share price south of \$14 as I write this), Cabletron is an appealing take over candidate. The acquisition of Cabletron—which just bolstered its own product line and distribution with the buyout of Digital's network business—would give IBM additional strength in key areas such as switching and net management.

Cabletron's stock has been battered by some bad corporate news and turbulence in the technology sector. But the company is solid and IBM should consider the opportunity before Cabletron makes a big buyout of its own or a competitor such as acquisition-minded Lucent or current partner Nortel snaps up Cabletron.

If Gerstner wants to try something smaller, how about grabbing up one of the remaining Gigabit Ethernet companies—perhaps Foundry Networks, an early leader? That type of deal would put IBM in the forefront of this hot market and give it a competitive edge against Cisco, which has struggled to bring out its own Gigabit Ethernet offerings.

Either deal would continue to flesh out Gerstner's vision of network computing—a vision that has already been firmly grounded on the software side by the acquisitions of Tivoli and Lotus. And here's another plus. I won't seek any advisory fees for my advice. Promise.

John Gallant, editor in chief

jgallant@nww.com

Speaking the LANGUAGE • Linda Musthaler

Storage decision is no longer open-and-shut

When was the last time you gave much thought to your decision about primary storage solutions? Many companies don't consider it a decision at all—they simply use whatever storage resources come with the server they buy. Well, a few things are happening that should make you think about your storage choice.

First, Fibre Channel technology is becoming increasingly important. While Fibre Channel has been around for a few years, it is now more crucial than ever because of the growing popularity of server clustering, which necessitates the move from internal to external storage. The traditional method for connecting external storage to a server, SCSI, can support the clustering of at most two servers; Fibre Channel allows you to connect any number of servers to storage units.

Although a Fibre Channel-attached storage solution may cost more up front, it holds the promise of a lower overall cost of ownership over the lifetime of your system. This promise comes in the form of greater growth potential, expandability, reliability, speed and distances that can be served.

However, Fibre Channel connectivity is not without controversy. Some vendors have chosen to implement proprietary Fibre Channel solutions; other companies are pushing for industry standards. Even the advancement of standards was controversial for a time, with two different bodies working on them. The two joined forces, and the resulting Fibre Channel Loop Community now is the standards bearer.

Second, storage technology is changing rapidly, accompanied by an equally rapid drop in price. While users' primary storage requirements are growing at an average rate of 40% per year, the storage density per drive is increasing at an average of 100% per year. Thus, we can fit more information in less space, reducing overall costs.

This is especially good news for server vendors such as Compaq, Dell, IBM, HP and Digital Equipment, which bundle internal storage with many of their server products. Because up to 50% of the price of a server can come from the storage component, these vendors can reduce prices on their servers while simultaneously offering higher capacity products. Most of these vendors also have announced storage strategies that include external Fibre Channel-attached storage

for clustered servers.

Third, like other industries, the storage market is undergoing consolidation. The merger announced last month between Storage Dimensions and Artecon is a case in point.

Mergers are inevitable, given the evolutionary pace of storage technology. There are just too many specialty vendors that will have to close ranks to offer broader product lines to a burgeoning PC LAN market. This industry consolidation means you have to look more closely at the viability of your storage solution provider.

So now that you know why you should give some thought to your primary storage solution, let's look at your options. The choices basically come down to internal vs. external storage.

Internal storage usually refers to a RAID that is a physical component of your server. The storage component has most of the features necessary to make it virtually fail-safe, but it still depends on the server for cooling and power systems. The storage capacities of today's servers are quite sufficient for many small businesses or departmental applications.

External storage is another box (or boxes) that takes directions from the server via software. The physical connection is either SCSI or Fibre Channel. More than 90% of the connections today are SCSI-based, but the ratio is beginning to swing toward Fibre Channel.

External storage always has been fairly common in the Unix environment, but it is growing in popularity in the PC LAN environment, largely due to server clustering. In many instances, external storage is server independent.

How do you decide whether to go with internal or external storage? In general, internal storage should meet your needs if your capacity requirements are small, you don't intend to cluster your servers, you don't have the space for separate boxes and you are highly committed to one server vendor.

External storage is a good option when you run out of internal storage, want to run server clusters, have a heterogeneous server environment or want to consolidate storage.

Of course, these are just rules of thumb. What's certain is you'll have to give your own decision a lot more thought than you may have in the past.

Musthaler is vice president for Currid & Co., a technology research and assessment firm based in Houston. She can be reached at linda@currid.com.



MESSAGE QUEUE

Send letters to nwnews@nw.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

SBC and others respond

Editor's note: The following letters are in response to our telecom case study of SBC Communications ("Stall Tactics," Dec. 8, 1997, page 1).

The debate over competition in local and long-distance telephone service has sometimes created more heat than light. That was certainly the case with your article on how regional Bell operating companies allegedly are thwarting competition, using SBC as an example.

The bottom-line reason for the pace of competition in the local service market is, simply, the bottom line. The long-distance giants have little desire to compete for most customers' local service. Why? Because, for the most part, local residential service is a money loser. The fact is that local phone service is still heavily subsidized, to the point that it generally costs about \$10 per month more than what is charged. The balance is made up in local toll calls, access charges, vertical services and business rates, which are set two to four times higher than residential rates.

Conversely, business customers, with their artificially high rates, have become prime targets. MCI recently announced it would offer local service to midsize and large businesses in three Texas markets. Evidently, even small businesses are not worth the effort any more.

The very deliberate pace into local service also pays off for the long-distance carriers by creating the impression for regulators that sufficient competition does not exist to allow RBOCs into long distance. This, too, should not be surprising when one considers that what is at stake is the huge long-distance market, with its comparatively huge profit margins, which the long-distance oligopoly is desperately trying to protect.

Skeptics will then ask about our incentives to keep competition out of the local service market. Granted, we are not anxious to lose a single customer. But we are very anxious to get into long distance, which will position us to become very effective competitors to those companies which today can offer our customers

what we cannot — all telecommunications services on one bill.

We won't get there, though, unless regulators believe our networks and markets are open to competition. That is why SBC spent more than \$1 billion through the end of 1997 to open its networks. That's why we assigned more than 3,000 employees to the task. We have signed 270 interconnection agreements with competitors who have resold more than 500,000 of our access lines to their customers, and we processed more than one million competitor orders.

We have made it as easy as possible for competitors to take our customers. Has it been entirely smooth? Of course not. No undertaking of this size and complexity could be. But we have made more than a good-faith effort to fully comply with the letter and the spirit of the law.

An objective case study of local competition offers one lesson: Where there is money, there is plenty of competition. Where there is less financial reward, there is overheated rhetoric. Let's spend less time focusing on rhetoric and more on the economic realities that have always driven competition.

*Royce Caldwell
President
SBC Operations
San Antonio, Texas*

Judging from my experience with Pacific Bell in San Jose, Calif., I would say that SBC Communications is stalling partly because it is full of incompetent technicians who cannot perform reliably in the current noncompetitive environment, let alone a competitive one.

My mistake was to try to have ISDN installed at home. I wanted to keep my existing number and long-distance provider, MCI; add three more numbers, one of which I wanted to be something memorable such as (408) 2-CALLME; and receive 128Kbit/sec on-demand data service to a local Internet service provider or my employer.

My first problem involved choosing the memorable number. Rather than listing which numbers were available or which blocks of numbers were definitely taken, PacBell works like this: You call them to find out if a number is available. They check and say no. So you call and try a different number. You repeat this process until bored.

Eventually the day came to install

my ISDN line. The guy in the central office did his thing, and the field technician confirmed that the Service Profile Identifiers were accepted and left. Soon thereafter I discovered I could make and receive calls on the two secondary numbers, but not the two primary numbers.

About a day later, PacBell fixed that problem. Then, I discovered that I could make and get calls on the two primary numbers, but I couldn't make long-distance calls, and I couldn't call one of the two secondary numbers. I asked MCI why I couldn't make long-distance calls (I was sick of calling PacBell at this point) and was told that PacBell had very kindly closed my MCI account for me.

It took another week to get the fourth number to work again and about the same time for PacBell to re-enable MCI as my long-distance carrier.

The whole affair seems to indicate that PacBell's technicians are incapable of correctly provisioning an AT&T 5ESS switch to do anything out of the ordinary. If the 5ESS were a brand-new switch, this might be understandable, but PacBell has been offering ISDN on 5ESS switches for years, so there is little excuse.

*Francis Turner
Corporate systems engineer —
West Coast
Bay Networks, Inc.
Santa Clara, Calif.*

Readers of your telecom case study involving SBC need to pause a moment and consider what the RBOCs are and what defines competition.

First, unlike the robber barons portrayed in your cartoon, RBOCs are independent companies accountable to both stockholders and regulatory agencies, each seeking success as any other company does. Ours is a regulated industry, but our assets and profits are private, so don't be surprised if we defend the best interests of our investors.

Second, let's consider what competition means. I used to think, back before the telecom act became law, that competition meant another company doing what RBOCs do: that is, operating a network to deliver services in local markets. I imagined a world of cable companies, wireless operators and others building bypass networks to deliver both business and residential communication services across a metropolitan region. This is the competition the RBOCs are eager to see.

However, now that the act has passed, it seems clear that our competitors are more interested in reselling RBOC assets. They want to get into the market without any risk or investment. This is not competition, it is not in the spirit of the telecom act, and our efforts to defend ourselves are justified.

*Toby Jessup
Principal engineer
US WEST Enterprise Networking
Seattle*

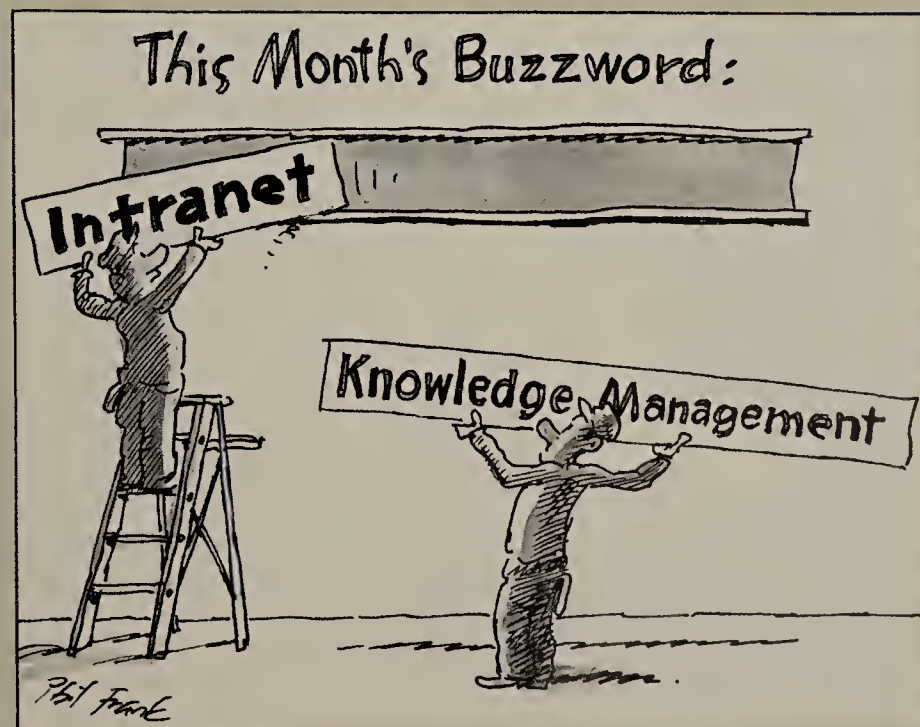


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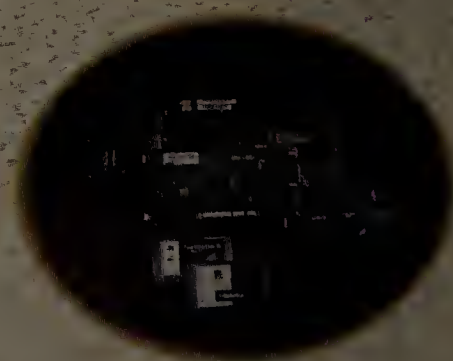
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END USERS WILL QUASH THE IDEA THAT THIN CLIENTS CAN REPLACE THEIR PCs.

PC users won't take NC for an answer

By Geoffrey James

Make a note: 1998 will be the year that sees the death of the notion that a network computer (NC) can replace a PC. When NCs were announced, they were positioned as the first real threat to the hegemony of the Wintel PC platform. Industry analysts at firms including Gartner Group, Inc., The Yankee Group and International Data Corp. estimated that an NC, or the later network PCs, would cost around \$3,000 less per year to own and operate than a traditional PC, a sum that would get the interest of cost-conscious top managers.

This year, you'll find that thin clients — be they NCs, network PCs or Windows terminals — may find a niche as a replacement for dumb terminals, but one simple fact will deny them further glory: End users won't give up their PCs.

In a recent poll of 300 *Network World* readers, only 12% believed end users would agree to give up their PCs in return for a more stable and reliable thin client. Similarly, 72% of the respondents said they did not plan to deploy thin clients at all, be they NCs or network PCs.

These findings were corroborated by a Zona Research, Inc. survey of 139 IT executives, 85% of whom said they had no intention of deploying thin clients. Based on the study, Zona concluded that "thin clients will largely have a user profile that reflects the users of traditional terminals."

The results of both surveys are reflected in the lackluster commitment among hardware vendors for at least one type of thin client — the Microsoft Corp.-blessed NetPC implementation. In September, IBM decided there wasn't sufficient demand to justify building a separate line of NetPCs, a decision that quickly was echoed by Micron Electronics, Inc.

Other vendors say they remain committed to building a NetPC, but it doesn't appear the devices are on their front burners. For example, Gateway 2000, Inc. in May 1997 announced a NetPC but hasn't yet brought it to market, according to Jeff Hanson, a public relations manager at the firm. Even Digital Equipment Corp. — a company whose background in traditional time sharing would seem to make it an ideal candidate to embrace the NetPC — is taking a wait-and-see attitude and hasn't yet announced an implementation.

That approach is probably wise, says Rob Enderle, senior analyst at Giga Information Group, of Santa Clara, Calif. "The products haven't been selling particularly well," he says. He attributes the NetPC's failure to grab market share to a "screwed-up launch by Intel [Corp.], which didn't deliver the right message because it was afraid that [the NetPC] would threaten its existing architectures."

Maybe so, but the survey results and other anecdotal evidence suggest there also is something fundamentally unappealing about the thin-client concept in general.

A clue to the real problem can be found, of all places, on Sun Microsystems, Inc.'s Web site. In its white papers section, Sun, a major NC backer, saw fit to publish a commentary addressing the "Danger of end-user reaction against NCs." It warns: "[End] users may view Network Computers as an attack on their independence, productivity and enfranchisement. If forced by management edict to switch to NCs, there are certain to be PC withdrawal symptoms in the form of complaints, intentional difficulties, unreasonable requirements and so forth." In other words, end users want PCs — they don't want NCs.

"Even if the NC is better technology, it's probably not going to be accepted," says Tim Hoy, applications and systems manager at Omni Healthcare, a health maintenance organization that serves northern California. "The typical end user thinks of his desktop or laptop as 'his computer' — not as the company's computer. Who would willingly give up control of their own computer?"

Even companies that are planning to use NCs to replace dumb terminals don't plan to throw out their PCs. "We're planning to replace



DAVID SCOTT SINCLAIR

the X terminals in our call centers with NCs sometime in the future," says Sally Davenport, media relations spokesperson for Federal Express Co. "But we're certainly not going to take PCs away from people who need them to perform their jobs."

Otto Folprecht, corporate IS manager at Tree Island Industries, a Vancouver-based manufacturer of steel parts, agrees the idea is of limited value. "I don't believe that managers are good candidates for NCs because they're going increasingly mobile," he says. "They want laptops or PCs with removable hard disks."

A revolt at McDonald's

Despite all the talk about NCs, most implementations are in the prototype or pilot phase, so it's too soon to say for sure whether they'll live up to their promise. But if McDonald's Corp. is any indication, they surely won't.

McDonald's implemented an NC-like device several years ago, says George Vidinich, staff director for the fast-food chain. For select users at its Oak Brook, Ill., headquarters, the company installed desktop devices that, like today's NetPCs, were stripped of all application software. The devices did have their own C: drives, but these were to be used only for the DOS disk that was required to boot the machine and supply network connectivity, and as a cache to improve desktop and network performance. All Windows operating software, applications and data storage resources were server-based.

Users hated the new system, Vidinich says. They immediately began devising ways to get around what they saw as restrictions. For example, they figured out how to copy the operating system and key application executables onto their cache drives in order to get free of the network. This created multiple local versions of various pieces of server software, which added to the support burden — the opposite of what was intended.

McDonald's finally decided to offer end users two desktop options: the NC and a more traditional PC LAN environment. There is now so little demand for the NCs that when McDonald's upgrades to Windows 95, it will kill the NC option altogether.

It could be argued that a modern NC implementation wouldn't have allowed the end users to subvert the system. However, what's interesting about the McDonald's experience is that end

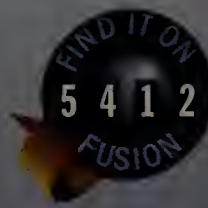
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users thought it necessary to subvert the system in the first place. The reason, according to Vidinich, was system stability, one of the things NCs are supposed to improve. A major crisis occurred whenever the network, which had a relatively high uptime, went down. "People felt that it was stupid to have a computer on your desk that didn't work when the network isn't working," Vidinich says.

More risk and complexity

Traditional PCs connected to traditional PC networks allow individuals to keep their own data on their own machine and to keep data that's intended to be shared on the network. The network also provides a convenient place to back up personal data files. In such an environment, the failure of one individual's desktop device remains an annoyance rather than a disaster. While some data may be lost, the individual generally can find or borrow another PC and start working almost immediately. Similarly, if the network goes down, the inability to access shared data may be inconvenient, but most office workers will be able to switch to activities that don't require the network, using sneaker net or dial-up modems to share information.

With NCs, by contrast, every network failure is an unmitigated disaster because nothing meaningful can get done until the network is up and running. The solution, according to Greg Blatnik, a vice president at Zona Research, is "networks with very high uptime." How high? "One hundred percent uptime will be required," he says.

To make matters worse, networks that support

thin clients will be more complex than current LAN designs because they'll have greater and different types of burdens, says Ellen Carney, worldwide director of network integration and support services in the Westborough, Mass., office of Dataquest, Inc., a market research firm. It's unclear whether shifting the support burden from the desktop to the network will result in a more stable system, she says. The desktops may become more stable when the network is running, but the network itself is likely to become less stable and more difficult to maintain. "Some companies may find that they've simply, in the words of the old commercial, traded a headache for an upset stomach," Carney says.

And even with 100% uptime, it's unclear whether end users would be happy. At McDonald's, for example, end users were accustomed to being able to predict whether they could get work done on time based on prior experience with the performance of their PCs. With the thin-client implementation, on the other hand, system performance slowed down during spike times — such as right before a deadline. Users found this unacceptable, not to mention frustrating. "We tried to take the 'P' out of the 'PC,' and that was a big mistake," Vidinich says.

Of course, system degradation during peak usage could be solved by adding massive amounts of server horsepower and network bandwidth that's unused most of the time — an investment that, if history is any guide, most companies are unwilling to make. And thin clients are supposed to save money rather than create demand for high-priced server hardware and redundant network hubs.

Cost savings from the thin-client implementation proved elusive at McDonald's, where the total cost of ownership went up rather than down, Vidinich says.

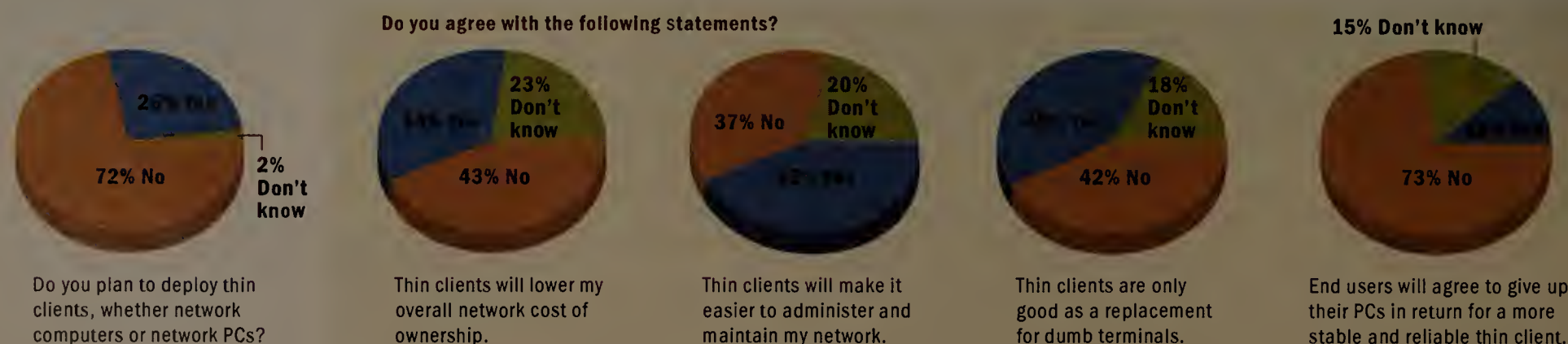
One reason was end users began purchasing more laptops in order to get work done untethered. This meant the IT group had to support the NC-like device and a laptop for many end users. "Unless you're willing to throw out every PC — including laptops — the NC simply becomes another platform to support, which only adds to your infrastructure costs," he says.

Sending the wrong message

Despite the fact that cost savings might prove elusive, some industry analysts — Blatnik for

END USERS SPEAK: 'HANDS OFF MY PC'

Although some users see merit in the idea of thin clients, almost three-fourths of respondents to a recent *Network World* survey said they won't implement them. The key reason? End users won't give up their PCs.



Based on a survey of 300 *Network World* readers conducted for the 1997 *Network World/Deloitte & Touche Consulting Group Technology Planning Survey*.

one — insist that NCs are a good idea. The important issue for Blatnik isn't system stability as much as it is system abuse. "I'm of the simple belief that when you're in the office, you shouldn't be doing 'personal' computing," he says. "Corporations are getting to the point where they won't tolerate abuses such as X-rated Web surfing, playing 'Doom' and answering personal e-mail."



Dataquest's Ellen Carney warns thin-client users may find they've "traded a headache for an upset stomach."

But there's a downside to such top-down control of computing resources — the erosion of trust. "The NetPC, as currently implemented, is a safer PC from a management viewpoint, [but] it says some pretty ugly things," says Kim Brown, vice president and chief analyst at Dataquest's San Jose, Calif., office. "It says to employees that 'we [management] don't trust you.'" Thin clients thus represent a way of thinking, a philosophy about the nature of employment and management, rather than being just a new technology. Stripping the control of computing

Thin clients are not all alike

This story, for the most part, discusses the multiple types of thin clients as a group, but there are differences between them.

■ **The network computer (NC)**, as originally conceived, is intended to download and run Java applets and applications and to do this without a Windows operating system. It uses a server for storing and managing files. Because there are relatively few Java applets, most NCs being used in corporate deployments are accessing applications that run on Unix servers and IBM mainframes (and many times have extra software to access Windows applications on NT servers).

resources away from end users harkens back to traditional notions of top-down, industrial-age management.

That's exactly the sort of thinking management consultants say leads to business failure.

However, the nail in the coffin of the "we can't trust end users" argument is one of the major trends in today's business world — the extended workday. Salaried workers in America now work an average of 164 hours longer each year than they did in 1970, before computers came on the scene, according to Harvard University economist Juliet Schor. Mobile computing and telecom-

muting, rather than allowing professionals to work at home instead of at the office, have resulted in an increasing number of hours being spent doing tasks for the corporation.

It's one thing to demand that factory workers who punch a time clock stick to their appointed tasks. It's quite another to expect the typical 60-hour-per-week road warrior to work hundreds of hours of overtime without the ability to use the company's computers for a reasonable amount of personal business and, yes, even recreation.

That's why end users simply aren't going to buy into the thin-client story.

■ **The NetPC** is based on a specification created by Microsoft Corp. and Intel Corp. It's a Windows PC that can but doesn't have to be offered in a sealed case. The Net PC downloads most of its software and data from a server, and can be managed remotely because it has client software such as Intel's LANdesk client. ■ Another category of thin clients is the **Windows terminal**, a desktop device that accesses Windows applications running on multiuser NT servers.



Having already paid the price of being "empowered" by the PC, they're not likely to give up the benefits they receive from "owning" their computing resources. Even NC proponents such as Blatnik agree this is the case.

"We've given people the idea that freedom and automation go hand in hand," he says. "If you give the impression that you're taking that away, you could end up with *Mutiny on the Bounty*."

James is the author of Success Secrets from Silicon Valley, to be published in paperback by Random House in March. He can be reached at www.businesswisdom.com.

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Trouble in the skies?

Continued from page 1

All eyes in the gallery of spectators are locked on the heavens. Oohs and aahs fill the air along with enthusiastic applause. White contrails paint the darkened sky, and two minutes into flight, the rocket is little more than a speck, twinkling with the stars.

Motorola may be enjoying ovations for its launches now, but the real question is whether Iridium — and a gang of other emerging satellite services — will command the same attention from corporate users.

Considering the reactions from dozens of *Network World* readers, Iridium and other LEO satellite service providers have their work cut out for them.

"We haven't identified any business need," says Sally Grant, assistant vice president of network development at USAA, a large financial and insurance firm, of San Antonio, Texas. "How could this change our business?"

"I don't have any clue about these services," says Brian Beatson, manager of data communications at Riggs National Bank, of Riverdale, Md. Beatson's comment echoes the sentiments of many users — either they don't know about emerging LEO services or they don't view them as a strategic technology.

Voice a big bust

On the voice side, telephony services offered by Iridium, Globalstar and others are shaping up as a big bust in corporate circles, with a few exceptions.

The services mostly will be transparent to users, says Bob Egan, director of Gartner Group, Inc.'s Network Services unit, in Stamford, Conn. Iridium and Globalstar will forego direct sales of their LEO satellite services to users, instead selling capacity to franchised carriers and Internet service providers. The reason for that strategy is LEO providers are trying to curb their operational costs because they are sinking billions into their celestial infrastructures, Egan says.

The satellite services will allow telephony carriers to provide uniform quality of service across the globe, Egan says. When you call Bell Atlantic Corp., for instance, the carrier may choose its preferred international transport mechanism — which could be an undersea cable or a satellite pipe. Participating interexchange carriers could sell the service as a local-loop bypass to connect to their points of presence.

However, satellite telephony is likely to wind up as a fringe offering because its most immediate application is for mobile salespeople and other executives who frequently travel globally. The integration of satellite phone with existing cellular services is a sound fit for that niche, but initial pricing may scare off all but the most bleeding-edge users.

"There are too many good deals for existing services," says Gerald Sallee, manager of network architecture at Kellogg Co., in Battle Creek, Mich. "These satellite services are just too iffy at this point."

Iridium is estimating initial handset costs for its network at \$3,000 and airtime service costs ranging from \$1.75 to \$3 per minute. Ouch. Globalstar is keeping handset costs down to \$750 and expects to wholesale airtime to carriers for a low of 30 cents per minute, but carriers will likely charge \$1 per minute domestically and perhaps \$1.25 per minute in other parts of the world.

And Iridium may not be able to guarantee uniform rates globally because franchisees are allowed to control rates in their own territories.

tralize all that and let us bargain for discounts," Abrams says. He adds that if Iridium proves it can solve the integration of cellular voice services and provide unified billing, "we'd like to have their phones in our pockets as well." But he does not see much need for the company's satellite telephony services.

There's another reason satellite phone services may well bomb in corporate America — LEOs have problems serving urban canyons. A user in New York, Chicago or other metropolitan areas may experience signal shadowing off buildings, which amounts to signal distortion or loss. Even within a building, if you're not within line of sight of the satellite, you may be out of luck. And if you work in a building with metallic glass, odds are the signal won't penetrate.

AIMING FOR THE STARS

Here's how two prominent satellite phone projects compare:

	Globalstar	Iridium	Comments
Number of satellites	48	66	The equivalent of an SS7 network in the sky for Iridium.
Altitude (miles)	750	483	Some concerns for signal strength to urban canyons.
Uses	Mobile voice, fax, e-mail/data	Mobile voice, fax, paging	Both target same markets.
Modulation scheme	CDMA	TDMA	CDMA allows reuse of frequencies; TDMA requires spectrum exclusivity.
Spectrum band operation	L (1.2 to 1.6 GHz) S (2 to 4 GHz)	L Ka (20 to 30 GHz)	
Spectrum sharing	Yes	No	
CPE costs	\$750	\$3,000	May change if Globalstar costs rise due to ground station costs.
Airtime charges per min.	30 cents to \$1.25	\$1.75 to \$3	Iridium costs will shrink with demand, but by how much?
Availability	Q4 1998	Sept. 23, 1998	

Iridium is exploring the possibility of uniform global rates for multinational companies, but "we have to make sure all our franchisees are in agreement," says Craig Bond, executive director of terrestrial services.

That doesn't bode well, especially given the aggressive competition in the market for personal communications services, says David Berndt, program manager in the Wireless Mobile Group at The Yankee Group consulting firm, in Boston. "[LEO service providers] will commit suicide if they make a run at the domestic market," Berndt says. "The real market for these companies is the international traveler, period."

One user who is taking an interest in Iridium is John Abrams, manager of research in the systems group at fast food magnate McDonald's Corp., in Oak Brook, Ill. "We're excited to see those launches," he says. But the company's interest initially will be in Iridium's paging service, not its satellite voice offerings. With so many executives and other personnel traveling to McDonald's sites in 103 countries, Abrams says it's not uncommon for a single user to be followed by five or more paging bills.

"We're looking for one company that can cen-

"Are you going to tell your CEO you paid \$2,000 for a satellite phone he has to go out onto the lawn to use?" Berndt says.

Broadband a winner

As much as satellite telephony services appear to be a bust in corporate networks, broadband satellite services could well be the next boon in wide-area data services.

The networks are spearheaded by such companies as the enormous Teledesic Corp. venture financed by Bill Gates and Craig McCaw, and Motorola's Celestri business unit. The services will offer bandwidth on demand ranging from 64K to 155M bit/sec pipes and beyond.

"Broadband access via satellite is a big deal," says Russell Daggat, president of Teledesic. There is a ton of fiber available today, but it is largely in trunking networks, and 73 countries have no fiber at all, he says. "For a lot of users, it will become more economical to pay for bandwidth on demand, and that's what we'll deliver," he says.

Abrams agrees. "The next wave [the broadband nets] is quite a bit more appealing for a lot of reasons," he says.

For one, such celestial nets will enable users

to bypass local-loop carriers, many of which drag their feet to offer high-speed data services. More important, though, broadband satellite bandwidth-on-demand service will "signal the second coming of frame relay," Abrams says.

Basically, you'll be able to buy an aggregate amount of bandwidth and apply it as needed, Abrams says. "What we'll see is the frame relay concept — taking a small pipe and bursting it — taken to a more intense level," he says. That means you won't have to nail up

permanent connections to remote sites, but instead can allocate time slices of your aggregate bandwidth to various points.

Such services provide another major benefit by redefining service provisioning times for local-loop and interex-

change services. Instead of waiting three days to provision a frame relay circuit in California or a month in London, McDonald's can "eliminate the local-loop headache, remove the provisioning headache and drop a box in a store and bring it online in literally hours," Abrams says.

The big drawback is that broadband satellite data services are a good four or five years away from availability. The other unknown is pricing — neither Teledesic or Celestri has said much about service costs except that rates would be determined by resellers.

Speaking at NetWorld+Interop 97 last fall, noted economist and author George Gilder said hefty private-line prices at local exchange carriers will allow Teledesic to compete head-on initially, but "once those T-1 rates collapse, Teledesic will become a premium service."

Kellogg's Sallee doesn't think initial satellite rates will be competitive with frame relay. "There are real good frame [relay] deals out there," he says.

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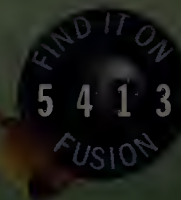
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Go online for more on satellite-based voice and broadband data services, including a chart that shows how Globalstar's and Iridium's services stack up.



Sallee also is wary for another reason. He notes that LEO providers have a tough road ahead striking international deals with carriers and ISPs to provide uniform global coverage and support. "It's yet to be seen how these relationships will work out," Sallee says. "I prefer to wait and see how it's being used."

The LEO providers' intention to deal with telcos instead of directly dealing with users frustrates Abrams. The carriers have an investment in copper and fiber that may well be encroached, he says. "You don't have a line of carriers at Motorola's door saying please do this," he says.

Anxious users such as Abrams are willing to prod carriers, but LEO champions are a scarcity at the moment. To succeed, the Motorolas, Teledesics and Globalstars will have to embrace the user community and then turn them loose on carriers to demand satellite service.

If the LEO providers don't take that route, they may well end up with voice and data services that don't fly.

When he wrote this story, Bruno was enterprise editor for Network World. He is now at The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, Ext. 118.

Simplified server updates

NetPro's Config Central earns our World Class Award for making it quick and easy to outfit all your NetWare servers with the latest NLMs.

By Dennis Williams

Software distribution and version control are annoying enough when you're dealing with client machines. When you have multiple servers, you can't help but think there must be some good way to keep them in sync.

NetPro Computing, Inc. has come up with one. Config Central helps network administrators manage the many versions of software drivers and NetWare Loadable Modules (NLM) on each of their servers.

By allowing you to take a proactive approach to server management, Config Central keeps your network healthier with less unplanned downtime. Config Central performs only a handful of tasks, but it carries them out well enough to earn our World Class Award.

Old NLMs, new problems

Often, you discover an outdated NLM only when a server crashes, forcing you to track down the culprit and install a new version. You then must update the server that experienced the hiccup as well as the rest of the servers on your network.

Config Central puts all that in the past by making it easy to keep all the NetWare 3.12 and 4.1X servers on your network loaded with the most current NLMs.

First, to help you spot version differences, Config Central generates reports that display what file versions are loaded on each server. The program scans for .NLM, .DSK, .LAN, .HAM, .NAM and .CDM files. The reports help you spot old files quickly, but they can be very large — our report spanned 67 pages. You can apply filters before generating a report to display only the NLMs you're concerned about.

The next step is to update the old files from a server with a more recent version. Config Central uses a reference server that you must keep up to date as the standard bearer for the network. You need one for each version of NetWare you use. Unfortunately, the program lacks the ability to scan the Novell, Inc. Web site for updated files, which would help with the chore.

A scheduling feature allows you to plan when updates are to be performed. For example, you can schedule them for overnight when server activity is at a minimum.

An undo feature lets you roll your server back to its original state after an upgrade. Just knowing this feature is available relieves a lot of the stress involved with system updates.

Config Central also allows you to send commands to each server from your desktop without having to use RCONSOLE. You also can use it to edit .NCF or configuration files on the DOS partition of any server and distribute the changes to multiple servers.

Installation

Installation is simple — all you need is a Windows 95 or NT client using Novell's Client 32 or VLM drivers. During the installation, Config Central scans the network for NetWare servers and asks which ones you want to manage. The program sends two agent NLMs to the selected servers and modifies their AUTOEXEC.NCF files to load the agents each time the server restarts.

The Config Central interface is simple, but there aren't any wizards to walk you through the most common tasks, so you'll need to keep the manual close at hand. Likewise, understanding the more advanced capabilities of the program requires that you refer to the manual. Thankfully, the documentation is clear, concise and full of examples with screenshots.

We were disappointed by the lack of a macro or scripting feature that would let us execute frequently performed tasks with a single click of the mouse. This would be handy for generating reports on a regular basis and outputting the results to a database.

Our other main disappointment was that we couldn't organize connected servers into logical groups. This isn't a big deal for smaller networks, but if you have a lot of servers or your server names are cryptic, it would be nice to group similar servers together rather than having them listed alphabetically.

NetPro offers a 10-server, 30-day evaluation version of Config Central on its Web site. That might be enough time to get your servers in shipshape, but to keep them that way, you'll have to shell out \$195 per server (less in volume). That sounds like a bargain to us.

Williams is a freelance writer and network consultant in Alpine, Utah. He can be reached at Dennis@ProductReviews.com.

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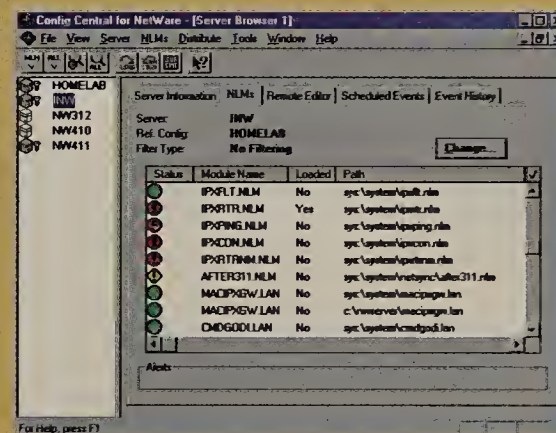
- Pros**
- ▲ Flexible scheduling function
 - ▲ Rollback capability
 - ▲ Easy installation
 - ▲ Can automatically undo changes across multiple servers
 - ▲ Works with both NetWare 3.12 and 4.1X

- Cons**
- ▼ No automatic access to Novell Web site
 - ▼ No macro or scripting feature
 - ▼ Can't designate logical groups of servers to be updated together



Scorecard	World Class Award
Driver distribution (40%)	10 x 0.40 = 4.0
Reporting (20%)	10 x 0.20 = 2.0
Automation (10%)	8 x 0.10 = 0.8
Server support (10%)	8 x 0.10 = 0.8
Ease-of-use (10%)	6 x 0.10 = 0.6
Installation (5%)	9 x 0.05 = 0.45
Documentation (5%)	8 x 0.05 = 0.4
Total score	9.05

Individual category scores are based on a scale of 1–10. Percentages are the weight given each category in determining the total score. The World Class Award goes to products that score 9.0 or better.



By sorting NLMs by status, you easily can determine which are older than those on the reference server.

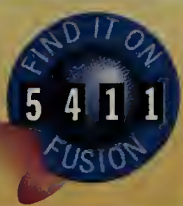
How We Did It

We installed Config Central on a Windows 95 computer running Novell's Client 32. We installed server agents on three IntranetWare servers in the same tree, a single NetWare 4.10 server in its own tree and a single NetWare 3.12 server.

We created a reference server and used it to update the other IntranetWare servers in the tree. We tested the scheduling feature, as well as the ability to reboot servers after an update. Our last test was to update the NetWare 3.12 server with IntranetWare file versions, and then roll back the server to its state before the upgrade.

Follow the links from Network World Fusion to get your evaluation copy of Config Central.

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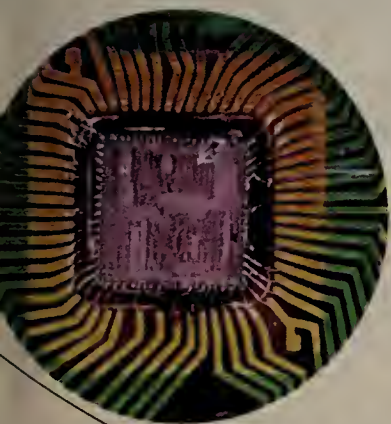
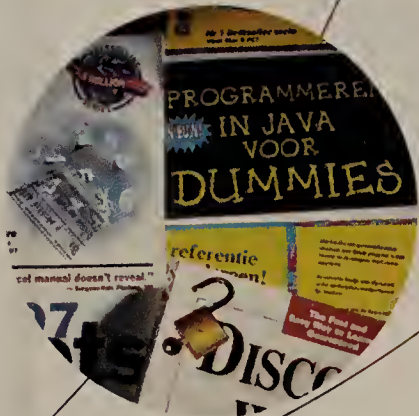
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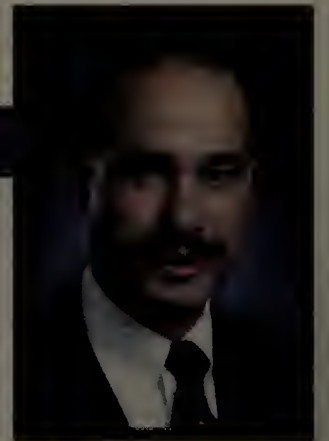
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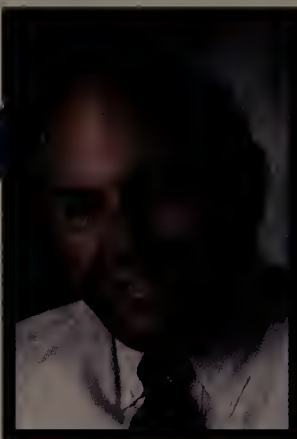
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Management Strategies

Show yourself the money

Feeling underpaid? Try these strategies for asking your boss for a raise.

By Loretta Principe

Network engineer Ron Carver was on a business trip with his boss. After a long day, the two were relaxing over a beer. Carver seized the opportunity to ask for a raise. "We started talking shop about another engineer who left for a better paying job," he says. "That's when I brought it up." The conversation netted Carver an extra \$5,000 per year.

Perhaps you've received pay increases in a more typical fashion. Take Nicholas Faber, a network consultant for OAO Corp., a technical recruiter in Greenbelt, Md. When Faber was a network engineer at General Electric Co., he simply expected an annual increase.

"We knew each manager got a pool of money to distribute for raises among his troops," he says. Faber believes he missed opportunities to get more of that pool. His biggest increases came when he jumped ship to a new company, though his former employer usually made him a lower counteroffer.

Does that sound familiar? If you're tired of job hopping but interested in earning more money, stay put and ask for a raise. But don't do it without a good game plan.

Preparation and timing are key, advises Thomas Leonard, an author on workplace issues and founder of Coach University, a Salt Lake City-based program that uses distance learning to train high-tech mentors.

Start by investigating the going rate in your locality for professionals with your experience and skill sets. Talk to friends, colleagues, headhunters and human resource representatives from other companies.

"Just by searching for a job on the Internet, you can find out the going rate at any time for your

skill set," Faber says. Go online to review the myriad job-search sites and salary surveys. You may find justification for a salary increase based solely on your place within the market's salary range.

Don't worry if your salary already is at the top end of the range. Step up to the line for a free throw, and be prepared to answer the likely question, "What have you done for me lately?"

Figure out how much you add to the bottom line, and then ask for a cut of it. Did you bring in a client or keep a client from walking? Are you working on an important deployment? How far would that project be set back without you? How much would it cost to replace you? How much value does IT add to the company?

"Some companies don't know how important IT really is," Leonard says. "Consequences are so extreme to the company. [They] can't afford the system not to be up and running." The person with the power to grant or deny your raise may not know the true picture.

When you have an idea of what you're worth and what the market will bear, it's time to educate the powers that be. Most managers are too busy doing their jobs to keep current on rapidly changing IT salary trends.

That was the case with

Carver's boss, who was surprised to hear that Carver's salary was below the market average for comparable positions.

Following up on the barroom discussion when he got back to the office, the manager hit the World Wide Web and confirmed the \$5,000 raise was in order.

Remember that your approach is as important as the numbers, Leonard says. Pop the question at the wrong time or in the wrong manner and you'll foul out in the first quarter.



To make an effective plea for a raise, Nicholas Faber says arm yourself with competitive salary information.

POPPING THE QUESTION

One of these phrases should help you open a salary discussion with your boss.



- When can we sit down to talk about my future here?
- I'm wondering if I'm underpaid compared with my colleagues in the industry.
- I'd like to discuss compensation.
- I'm looking to plan my future with this company. What do you expect from me in order to get regular, substantial raises?

Build a team by opening the floor for discussion, not by making demands. Put yourself in your manager's shoes and think about his goals, Leonard suggests. Managers want to build teams of talented can-do players who will go to the boards and have staying power. It's also a good idea to present your request as a way to keep your talents with the team for the long run and as a measure that adds value instead of costs.

Having another offer in hand sometimes is part of the game. "No one likes to be blackmailed," Leonard says. But the reality in the IT world is that a better offer from another company is the catalyst for many raises. However, Faber points out that if you have a job offer and your boss doesn't belly up with a reasonable counteroffer, you better be ready to move on.

If your company has an existing salary review system, be respectful of the internal procedures. But don't let it stop you from being entrepreneurial, Leonard advises.

If you can produce an impressive list of recent assignments and duties that were not part of your job description, an increase outside of the regular course of business may be warranted.

And don't give up, even if your boss denies your request. "No is just the beginning of the real discussion," Leonard says. "Often, the person saying no does not have enough information to say yes."

He suggests thinking about what it would take for your boss to say yes. Does he mean no forever or just today? Revise your game plan, and prepare for the next quarter.

Principe is an attorney in Springfield, Va., who prefers the gentler art of freelance writing about legal and employment topics. She can be reached at LWPPrincipe@aol.com.

FIVE STEPS TO ASKING FOR A RAISE

1. Investigate salary surveys.
2. Educate your boss.
3. Choose an appropriate time for discussion.
4. Use team-building phrases.
5. Be persistent.

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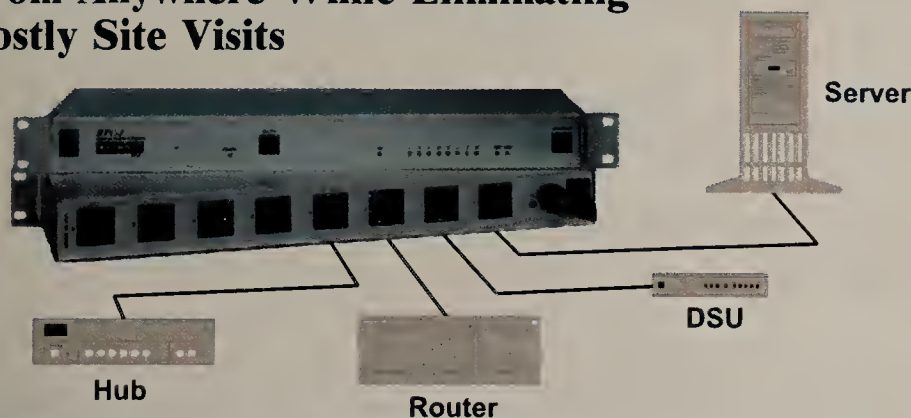
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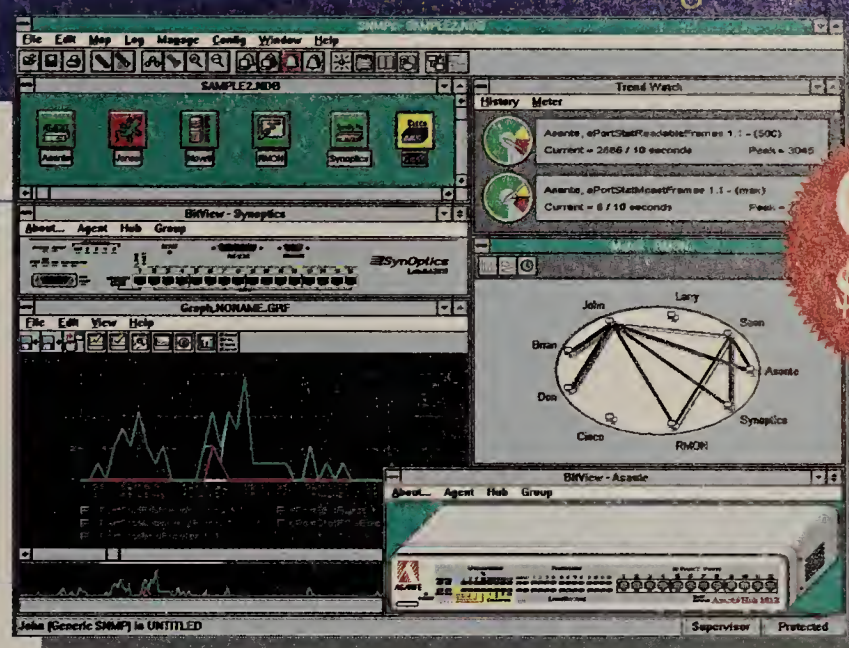
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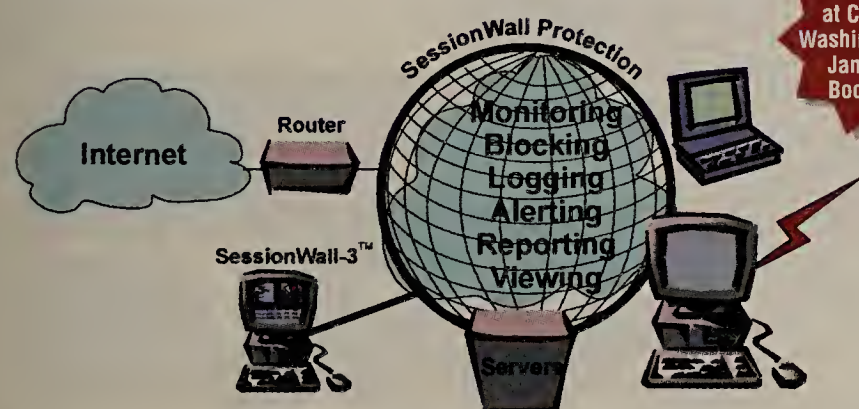


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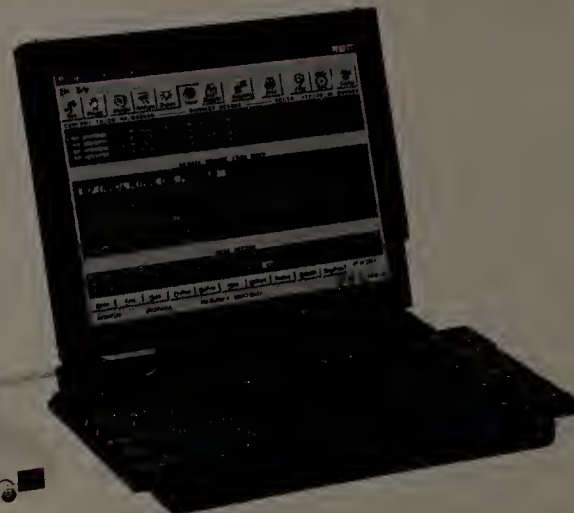
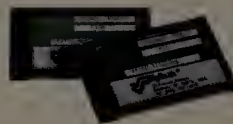
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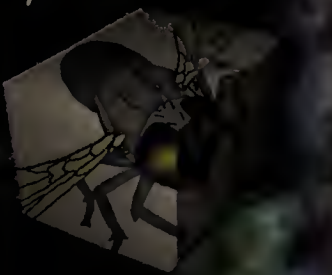
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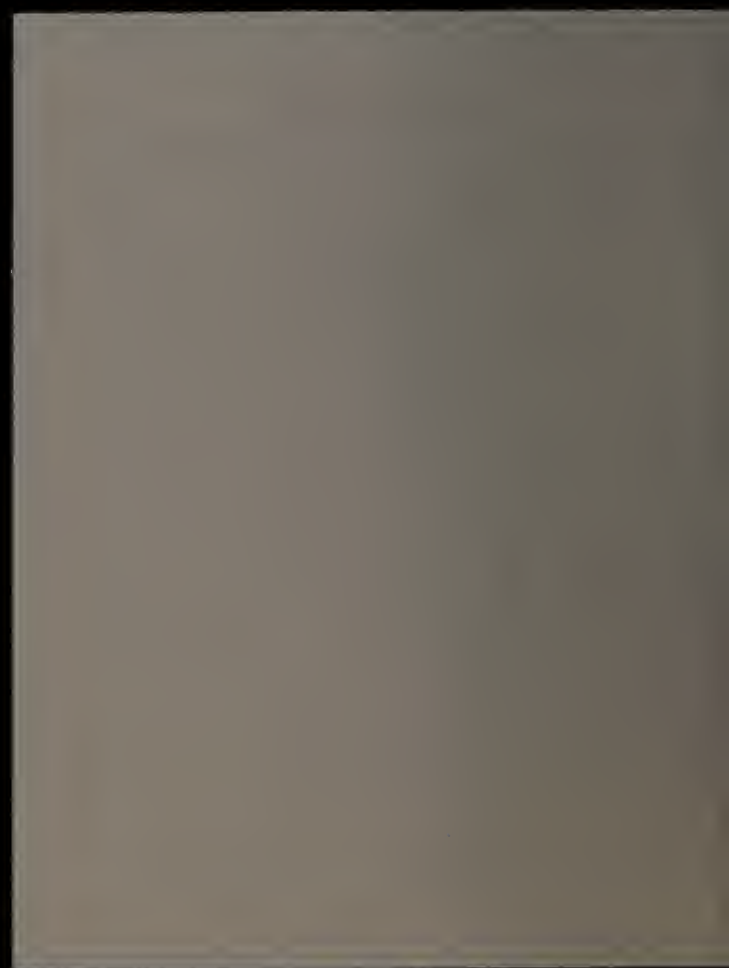
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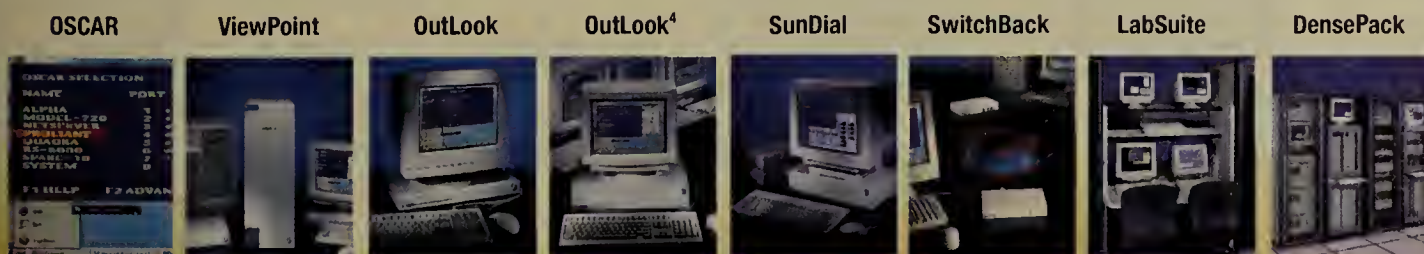
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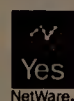


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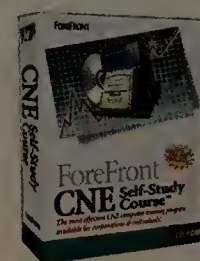
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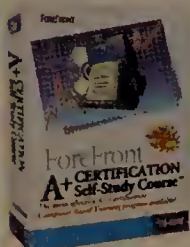
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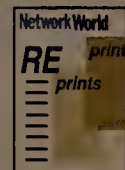
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Cisco concentrator to meld data, voice and video

By Jim Duffy

Washington, D.C.

Cisco Systems, Inc. next week will unveil a new access concentrator as part of a broad initiative to meld voice, data and video traffic on enterprise networks.

The MC3810 multiservice access concentrator is the result of Cisco's acquisition last year of start-up Ardent Communications Corp. The device replaces two models within Cisco's 3800 line of multiservice access concentrators, the one-slot 3801 and three-slot 3830 (NW, April 7, 1997, page 1).

However, Cisco still is developing an eight-slot 3880 multiservice access concentrator, said Peter Alexander, director of marketing in Cisco's Multiservice Access business unit. He would not say when the product will ship.

The MC3810 will be rolled out at ComNet '98 here as part of what Alexander described as a "comprehensive" data, voice and video integration strategy for the enterprise. The strategy is expected to focus on tighter integration between Cisco's StrataCom WAN switches and

the company's LAN routers and switches.

The MC3810 sits on the customer premises where the device melds Ethernet LAN, SNA, voice, fax and video traffic onto public or private leased-line, frame relay or ATM networks. As such, the concentrator can replace separate products for sending voice, data and video traffic into the carrier cloud.

The MC3810 features a single 10Base-T Ethernet interface, two serial ports for SNA and other data, six analog ports and 24/30 digital voice channels

over T-1/E-1 links. The concentrator provides IP and IPX routing, bridging, 8K bit/sec or 32K bit/sec of voice compression, per-call voice switching, faxing at 9.6K bit/sec and circuit emulation over ATM for video transmission.

The MC3810 also includes Multiflex, a feature that lets users reassign MC3810 trunks to another service — private, public, frame relay, ATM or time-division multiplexed — via software. This allows users to take advantage of lower tariffed services, Cisco said.

The concentrator is expected to run Version 11.3 of Cisco's Internetwork Operating System (IOS) software. The new edition of IOS features voice-over-IP enhancements and enables users to configure Cisco gear for toll bypass, unified voice/data trunking and Internet telephony gateway applications.

"The new box sounds like an improvement performance-wise. They've put some better compression capabilities on it," said Craig Johnson, an analyst at Dataquest, Inc., in San Jose, Calif.

The MC3810 is expected to cost between \$4,500 and \$9,000. Volume shipments will start in February.

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AOL

Continued from page 1

users exchange information over AOL's network using authentication tools from Security Dynamics, Inc., and encryption and tunneling features from a handful of firewall vendors, said David Gang, senior vice president of new products at AOL.

Firewall security also will be an important part of the overhauled service. AOL will announce deals with three firewall vendors in the next 30 days, Gang said, though he would not name the vendors.

The firewalls will let AOL Enterprise VPN customers support standard-based tunneling via protocols such as Internet Protocol Security, Gang said.

In addition to providing new security features, AOL is making its VPN service easy to integrate with customers' existing networks, Gang said.

While AOL's online service software is proprietary, the company is striking deals with the likes of Lotus Development Corp. and Netscape Communications Corp. to integrate their client software with AOL's dialer, he said. AOL is expected to announce final deals with software vendors next month.

Despite its efforts to make the service secure and compatible with other offerings, AOL still may have a tough time convincing customers that its network is up to the task of supporting VPNs, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm. This is especially true given that competitors such as AT&T WorldNet, MCI Communications Corp., UUNET Technologies, Inc. and Sprint Corp. all have introduced secure dial-up VPN services for business customers in recent months.

Last year at this time, AOL was trying to appease customers and attorneys general from 20 states

who were dissatisfied with the company's service. The onslaught of complaints came almost immediately after AOL went to its current \$19.95 unlimited access service offering, which attracted more customers and network traffic than AOL could handle. Since then, AOL has made modem and network upgrades.

Still, some users are skeptical.

"I'm amazed that they would try this right now," said Sharleen Smith, director of new technology at USA Networks, a New York-based television station. "Last year, when they came out with their all-you-can-eat, \$19.95 per month service, it nearly brought them down."

Other users agreed. "[AOL]

is not the company that comes to mind when we are talking about expanding our VPN," said Bob Dougherty, chief information officer and director of information technology at Subaru of America, Inc., in Cherry Hill, N.J.

AOL Enterprise VPN service is expected to be available this quarter for \$500 per user. ■

BUSINESSES BUYING INTO AOL

In a recent study by TeleChoice, 1,550 business users were asked to identify their primary and secondary Internet service providers. Here is a sampling of the results, based on the percentage of user responses:

ISP	Primary	Secondary
America Online	5.9%	11.5%
AT&T WorldNet	7.9%	3.7%
CompuServe	1.9%	3.0%
MCI	5.9%	2.1%
Netcom	5.7%	3.0%
Sprint	3.2%	2.0%

"This will be a difficult market for AOL," said Eric Paulak, senior analyst at Gartner Group, Inc., a Stamford, Conn., consulting firm. But AOL's new business relationships will strengthen the company's case, he said.

AOL and Security Dynamics last month quietly made an agreement under which they will put SecurID password authentication tokens in the hands of all AOL Enterprise VPN customers, Gang said. SecurID tokens provide users with dynamic password protection, which means the password appearing on the token card changes every 60 seconds for added security.

AT&T

Continued from page 1

Steve Sazegari, president of TeleMac, a Foster City, Calif., telecom consulting firm. Also on deck: branding partnerships with competitive local exchange carriers to extend AT&T's new local services business.

An AT&T official confirmed that one of the first agreements likely to come forward is a deal with Visual Networks, Inc. The Rockville, Md.-based company provides circuit analysis and monitoring equipment and software to help users measure carriers' service-level compliance.

Likewise, AT&T shortly is expected to announce a deal with RAD Data to jointly deliver E-1 access to multinational users — providing direct T-1-to-E-1 connection to an overseas AT&T E-1 circuit using RAD's multiplexing equipment.

But the carrier reportedly is seeking bigger fry. One of the major goals is to extend AT&T's managed WAN services beyond the router to include unified installation and management of servers and possibly workstations together with routers and frame relay access devices, Sazegari said.

AT&T a year ago promised to

fill in the LAN gaps in its managed WAN services but failed to do so under former CEO Robert Allen. As a result, until now users generally have had to go to AT&T's full outsourcing division, AT&T Solutions, to get complete LAN/WAN networks.

"But within the past couple of months, ever since Armstrong came aboard, I've been told by account people that they're close to making new arrangements with IBM, DEC or Cisco," said Hank Levine, a lawyer here representing users in contract negotiations.

Today, AT&T often promotes equipment, such as Cisco routers, on a subcontract arrangement so that users can buy their WAN equipment and services, such as frame relay, at the same time. New deals also would tie together the carrier and equipment vendor's management platforms and customer support so users could get quicker answers to their questions.

An AT&T spokeswoman would not comment on reports of talks with specific vendors beyond the Visual Networks deal. But those close to the company described AT&T as no longer willing to cede the advantage to MCI Communications Corp. and Sprint Corp. on partnership deals that press users' buttons, such as making avail-

able an SLA monitoring system as a standard feature on a managed WAN service, as MCI has just done.

To pull off these deals, AT&T officials will have to convince the networking industry's heavy hitters that the company has changed its stripes. Under Allen, "their attitude was, 'We'll do anything as long as we own 51% of it,'" Levine said.

Now the carrier is willing to do 50-50 deals, with such provisions as tie lines among its customer support centers. Those lines would pass off users to the equipment vendors rather than insisting that AT&T keep control of all customer interaction, Levine said. "That has been very rare for AT&T," he said.

AT&T now is expected to sign franchise agreements with up to six competitive local carriers to allow those carriers to use the AT&T brand, said Berge Ayvazian, senior vice president of The Yankee Group, in Boston.

Since many local carriers are owned by cable companies, Armstrong would have the additional advantage of promoting the possibility of AT&T-branded residential competition, Ayvazian said. ■

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Novell

Continued from page 1

summer, sources said.

According to Novell officials, the BorderManager upgrade will feature:

- Direct client-side VPN connections
- Secure links to non-Novell VPN servers

Novell's FastCache hums on NetWare

Novell officials said BorderManager FastCache may lose its performance advantage if the company ports the service to Windows NT.

Server environment	Peak performance for caching static HTML data (request/sec)
Sun Ultra Enterprise 3000 as a stand-alone Web server	550
Sun Ultra accelerated by a Compaq Proliant 6000 server with FastCache and NetWare 4.11	3,288
Sun Ultra accelerated by an Intel MB440LX DP server with FastCache and NetWare 4.11	4,055

SOURCE: MINDCRAFT, PALO ALTO, CALIF.

- Improved IP management functionality

Missing from the conversation about BorderManager's future, however, was the timetable for a cross-platform release. Despite public statements from Novell CEO Eric Schmidt in which he said the company would free all of its network services from NetWare dependencies, officials last week balked at porting BorderManager to either Windows NT or Unix.

Product details

One main focus for the upcoming release is better client access through support for Secure Sockets Layer and Point-to-Point Tunneling protocols. These technologies will allow PC users to establish direct VPN connections with any BorderManager server. Previously, two BorderManager servers were required to create a secure link over the Internet.

"This will make it easier for us to securely tend to our customers' networks regardless of our physical location," said Andrew Percy, president of Puzzle Solutions, Inc., a Novell channel partner in San Jose, Calif.

The BorderManager upgrade also will support the Simple Key Management Internet Protocol (SKIP), an emerging industry standard for defining how serv-

ers authenticate themselves via VPN connections over the Internet. The SKIP support will allow BorderManager users to set up VPN links with partners or customers who use non-Novell VPN servers.

Novell also is looking into enabling BorderManager servers to belong to multiple VPNs simultaneously. This capability would allow customers to set up multiple VPN connections to remote or customer sites without compromising security policies.

Topping the list of better administration capabilities is support for both Domain Name System and Dynamic Host Configuration Protocol.

This integration will simplify the task of managing dynamic IP client addresses and complex host names as Internet connections are established and terminated.

In addition to the BorderManager upgrade, Novell is

investigating a "black box" hardware/software combination based on BorderManager. This product would be a dedicated NetWare server designed to sit at the edge of a corporate network.

The black box would allow small, midsize and large customers to outsource Internet access management chores to Internet service providers that support Novell technology, said Ron Palmeri, vice president of strategic relationships at Novell.

Cross-platform switch?

Since Novell first floated the idea of BorderManager last March, officials have said the suite would eventually be cross-platform.

Michele Arden, vice president of the Border Services

Group, said this year the company will rewrite most of the BorderManager administration tools in Java so that they can run on any platform. However, Novell is taking a wait-and-see attitude about porting the BorderManager core to either Unix or NT, she said.

Arden cited recent third-party tests showing that a stand-alone BorderManager FastCache can serve up HTML content as much as seven times faster than a stand-alone Unix-based Web server (see graphic). "Why would we give up that kind of competitive advantage with a port to NT [or Unix]?" Arden asked.

She said customers have become accustomed to running dedicated network boxes with proprietary operating systems

such as Cisco Systems, Inc. routers running IOS.

"There is no reason why customers can't sprinkle NetWare dedicated caching boxes throughout their heterogeneous networks," Arden said.

This approach flies in the face of Novell's cross-platform vision, said Todd Chipman, an analyst with Giga Information Group, in Santa Clara, Calif.

"But maybe preliminary testing showed they can't really compete with similar Internet-based products that run natively on either Unix or NT," Chipman said. ■

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3Com

Continued from page 1

said Eric Hindin, program director at market research firm The Yankee Group, in Boston.

"It is really aggressive; I certainly didn't expect it to fall to that point," said another analyst, who requested anonymity.

3Com also will unveil the SuperStack II Switch 3900, which supports from 24 to 36 ports of 10M/100M bit/sec autosensing Ethernet and an integrated Gigabit Ethernet port. The 3900 also has an expansion slot that enables the device to house two additional Gigabit Ethernet ports.

Lastly, 3Com is introducing a SuperStack II Dual Speed 10/100 hub for \$79 per port. 3Com's current 12- and 24-port Dual Speed hubs are priced from \$175 to \$200 per port.

3Com will soon be leapfrogged, though, because Bay is expected to announce its first 10/100 hub, the BayStack 250. It will feature 24 ports at \$75 per port and will ship in March.

Cisco offers 100Base-T hubs for \$87 per port.

And in the WAN

3Com also will use the ComNet '98 show to reveal how the company will evolve its Total Control remote access concentrator into a high-horsepower multiservice access switch for carriers.

Over the course of the year, 3Com will upgrade the 16-slot chassis to support IP voice, video and fax. Today it supports only data. In addition, new modules will support high-bandwidth

access, including broadband cable modems and digital subscriber line technologies, as well as dial-up. The IP voice capability will be introduced next week.

The new capabilities are made possible by incorporating 3Com's EdgeServer Pro and HiPer Digital Signal Processing modules, which were introduced last year (NW, July 14, 1997, page 23; Nov. 10, 1997, page 31). Together, they can handle call setup and control, as well as intensive packet processing.

Next year, 3Com plans to upgrade the Total Control chassis itself, fitting it with Signaling System 7 (SS7) software, the signaling protocol used in telephone networks.

With phone network signaling capabilities, Total Control could act as a front end to larger, more expensive switches, directing traffic at the edge of the network to voice or data switches. For example, calls to Internet service providers might be identified and trunked to IP switches within the carrier network.

3Com is already working in conjunction with telephone switch maker Siemens AG and ATM switch maker Newbridge Networks Corp. on a way to guarantee quality of service across ATM networks, starting at the network interface card of a PC. Siemens is part of the effort to put SS7 on the Total Control chassis. ■

Bay's 100M hub pricing hits bottom

Not to be outdone by 3Com Corp., Bay Networks, Inc. this month will extend its line of 100Base-TX Fast Ethernet hubs and drive per port pricing down to \$75.

The new hubs included in the BayStack 200 Series are Models 202, 203, 204 and 205. The 202 features 12 managed RJ-45 ports at a cost of \$1,699, or \$142 per port.

The 203 sports 12 managed RJ-45 ports and one 100Base-FX port. The hub costs \$2,099, or \$162 per port.

The 204 features 24 unmanaged RJ-45 ports for \$1,799, or \$75 per port. The 205 has 12 unmanaged RJ-45 ports for \$1,099, or \$92 per port.

Currently, Bay also offers the BayStack 201, a 24-port unmanaged hub, which costs \$125 per port.

Web-based network management is available free of charge with the new BayStack 200 hubs. This allows users to locally or remotely configure the hubs without using Bay's Optivity network management software.

This is the first time Bay has provided Web-based management for its shared-media products.

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—Jim Duffy

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On track and tracked: Of GPS and blackmail

Where are you? I'm at N34° 16.925', W119° 17.586'. I know because a few weeks ago I received an incredibly cool product: DeLorme's Tripmate. This package consists of DeLorme's Hyperformance GPS receiver and a copy of Street Atlas USA.

Street Atlas is a very good CD-ROM mapping tool and can provide you with a route from anywhere to anywhere in the U.S.

But it's the GPS part that's amazing! The GPS receiver, called the Tripmate, tracks your position on Earth using the U.S. government's

Global Positioning System (hence GPS) and can plot it on the Street Atlas maps.

The accuracy of Tripmate is limited — the U.S. government only allows us peons access to what's called the Standard Positioning System (SPS). The high-accuracy version, the Precise Positioning System (PPS), is reserved for the kind of folks who want to drop bombs down chimneys.

Because the Pentagon doesn't want you to know exactly where anything is, they degrade the SPS signal with something called Selective Availability.

This means your position as determined by Tripmate is accurate to within 328 feet horizontally and 512 feet vertically for 95% of the time. (I'm told the PPS version is accurate to within inches!)

This is a great tool and, at \$199.95, you need one. It is one of those toys, er, tools, that you just have to have.

Last week my fellow *Network World* columnist, Scott Bradner, wrote about how people want to track you and he raised important issues of privacy and accountability. But he was just scratching the tip of the tracking iceberg.

Tracking people actually is not very hard. It doesn't require that your license plate be photographed or that you go around with a Global Positioning System receiver strapped to your car or yourself. And it's happening now.

The fact is, you leave electronic

spoor wherever you go. Go to the supermarket and pay with anything other than cash and you and your purchases are tracked. The same applies to purchasing gas, clothes or anything. What you paid for, how much, where and when becomes available to all sorts of organizations whether you like it or not.

The reason is that many retailers and service companies sell till and receipt data. Combine that with other publicly available data and they can get a pretty powerful insight into your (yes, your) life. And it happens that there are plenty of companies that do just that:

They compile databases from many sources for the purposes of exploring purchasing habits and targeting direct marketing programs.

I've always thought there's a good story in this. We could take such a database and reduce it to just the married men. We could then reduce it further to a subset that only includes men with an income over \$300,000. We could then look for, say, men who have bought ladies' lingerie.

Now, cross-reference that with till receipts to find what size lingerie and cross-reference that with purchases by the matching wives. Now, we filter out all those where the size of what he bought matched the size she purchased.

We'll also filter out those who were buying smaller sizes than their wives. What are we left with? Potential blackmail candidates. Either they have got large mistresses or they are cross-dressers. Whichever, it is time to pay the processor.

Joking aside, the serious issue is the degree to which your actions are recorded and the degree to which you are tracked already. And I have bad news: Being tracked, whether by GPS or by the spoor of your transactions, is a fact of 21st century life.

So, where are you? Coordinates to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504. DeLorme can be found at www.delorme.com.



Mark Gibbs



'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

WHO BREAKS A BUTTERFLY GUY UPON A WHEEL? He says he's not an Internet domain squatter, but at least one large corporation is warning **Hans Schnauber** to vacate the .org domain he has registered in the corporation's name.

Schnauber is president of the **International Federation of Butterfly Enthusiasts (IFBE)**, a for-profit organization based in Chehalis, Wash., which is dedicated to increasing butterfly habitat worldwide. You can find its Web site at www.ifbe.org.

In late December, the IFBE began registering .org domains through **InterNIC**, using the names of large corporations, sports teams, famous people and governmental branches.

Schnauber, who calls himself "The Butterfly Guy," says the plan is to post on each of those sites evidence outlining the effect its namesake has had on butterflies.

Media giant **Time Warner, Inc.** apparently finds the scheme less than heartwarming. Schnauber says he received an e-mail from a Time Warner executive demanding "that you surrender" the www.timewarner.org domain.

The Butterfly Guy says he's not interested in shaking down companies that want him to give up the domains that use their names. "I've given a few of them back because the companies asked nicely," he says.

However, those who resort to intimidation will incur the wrath of Schnauber and his federation of butterfly enthusiasts.

"I'm not going to be bullied by anyone. If they threaten us, we'll take them to the limit," he solemnly vows.

Corporate America, consider yourself warned.



IBM'S INVENTIVE WEB SITE The other morning we were preparing breakfast, musing over how we will make our fortune, when suddenly it hit us: Make a hat that looks like a fried egg and the world — or at least a few stray dogs — will beat a path to your door.

Unfortunately, our dreams of millinery legend were shattered upon learning that **Raymond D. Kiefer**, of Spring City, Pa., had obtained a patent on the fried-egg hat design in 1995.

We know this because of the **IBM Patent Server**, a Web site and server maintained by Big Blue that gives users access to information on more than two million patents registered by the U.S. Patent & Trademark Office.

The site lets users research patents dating back to 1971. Site visitors can simply type in keywords to find what they're looking for.

One particularly entertaining link on the site is the Gallery of Obscure Patents, featuring Mr. Smarty-Pants Raymond Kiefer's inspiration, along with a couple dozen others.

While we won't give them all away, allow us to save you at least some heartache:

- Pneumatic shoe-lacing apparatus — taken
- Self-containing enclosure for protection against killer bees — taken
- Human slingshot machine — taken

The IBM Patent Server is located at www.patents.ibm.com.

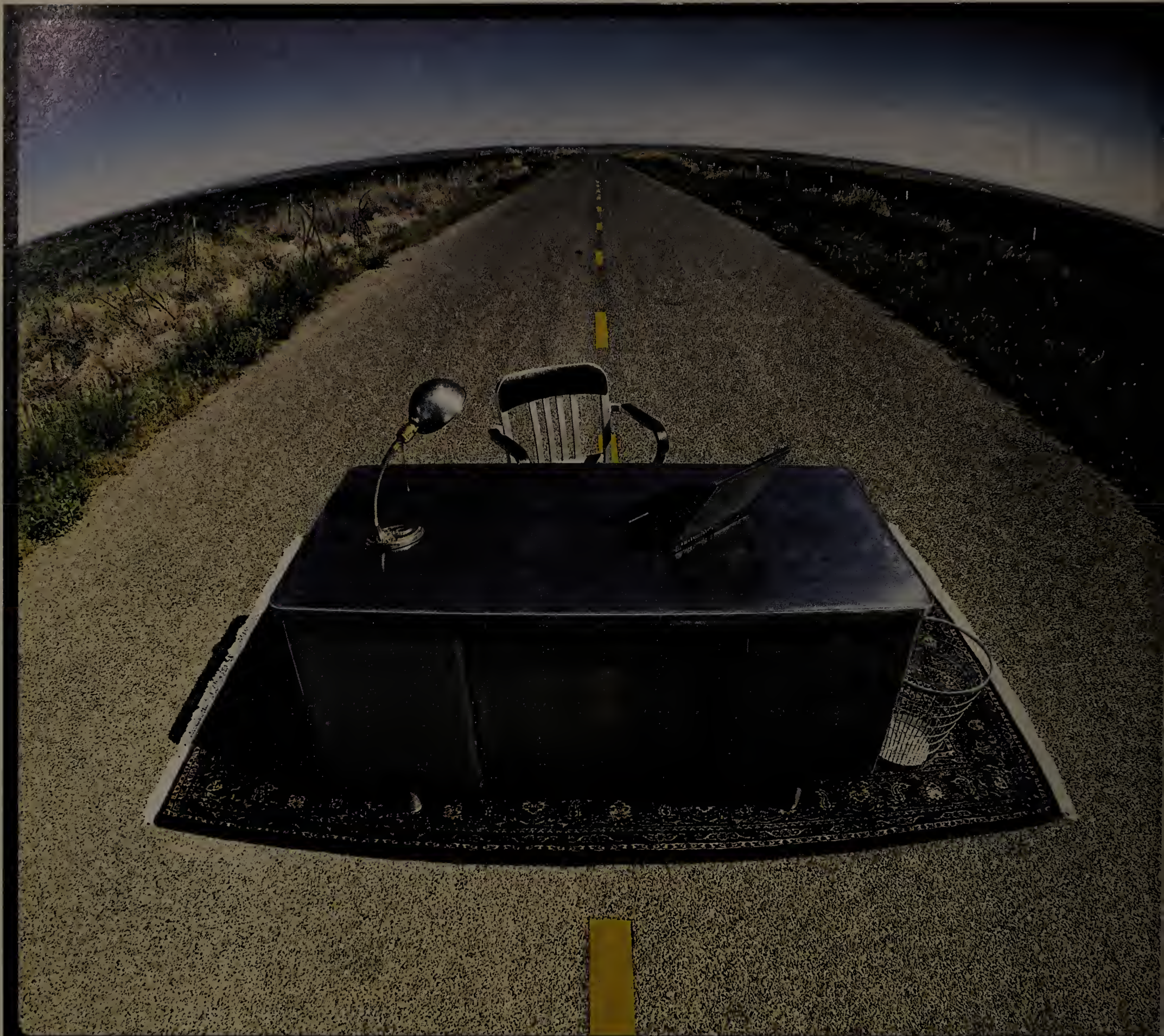
11,000 JAVA DEVELOPERS CAN'T BE WRONG Last summer, *Network World* ran a front-page story on a new group called the **Java Developers Lobby (JDL)**.

Formed in early August by **Rick Ross**, a Java developer based in New York, the lobby had about 200 members when our article appeared on Aug. 18. Now, just five months later, the JDL's ranks have swelled to nearly 11,000.

What's truly amazing about this is that the JDL has done next to no promotional work; its popularity has grown through word of mouth, press coverage and the group's Web site at www.javalobby.org. And the lobby has gained enough clout to be consulted routinely by **Sun Microsystems, Inc.** regarding Java issues.

Sure, **Microsoft** still blows them off, but hey, is that news?

The Butterfly Guy says, "If we have no butterflies, we have no bees. If we have no bees, we have no kiwis." *'Net Buzz* says, "If we have no Internet- or intranet news, our *'Net Buzz* editors will be turning the screws." Contact Chris Nerney at cnerney@nww.com or call (508) 820-7451.



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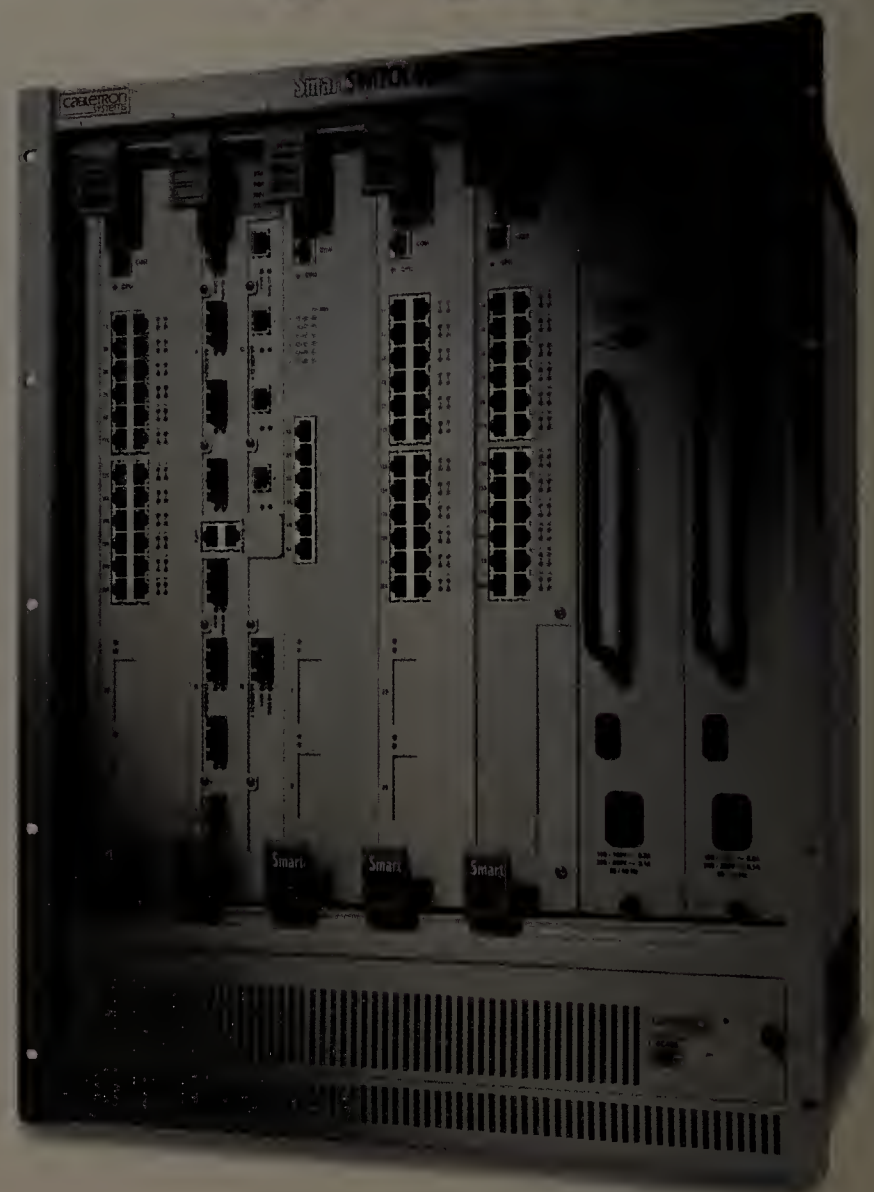
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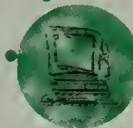
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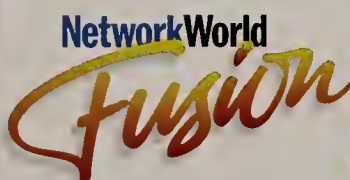
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